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Vol. XIX, No. 5 MAY, 1930

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

CONTENTS

Frontispiece and Sketch—Juan Manuel Noriega 431
Editorial:
The Seventy-Eighth Annual Meeting of the American Pharmaceutical Association 433
The Pharmacopœial Convention of 1930 435
Scientific Section:
The Pharmacology of Ergot: With Special Reference to Biological Assay and Standardization—Thompson 436
A Pharmaceutical Study of Hydrastis Canadensis—Hirose and Langenhan (*Concluded*) 449
The Effect of Certain Hypoglycemic Drugs upon the Growth of the Seedlings of Lupinus Albus—Krantz, Jr. 458
Amino Alcohols IV—Krantz, Jr., and Hartung 461
Studies on the Analysis and Chemistry of Neoarsphenamine II. Studies on the Chemistry of Sodium Formaldehydesulphoxylate and Their Relation to the Structure of Neoarsphenamine—Jurist and Christiansen 464
An Empiric Assay for the Resin Content of Compound Pills of Mercurous Chloride—Warren 468
Assay of Ointment of Yellow Mercuric Oxide—Green and Schoetzow 471
Bibliography of Pharmaceutical Research—DuMez 472
A New Explanation of an Old Incompatibility—Bauer 475
Historical Fragments—Kremers 480
Department of Business Management:
Comments, Questions and Suggestions Are Invited and Welcome 484
Salesmanship Problems in Drug Stores—Olsen 484
Address of the President of the American Pharmaceutical Association—Dunning 487
Coöperation with Hospital Pharmacists—Irons, M.D. 498
Address of the Chairman of the House of Delegates—Swain 499
The Department of the American Association of Colleges of Pharmacy:
Address of the President of the American Association of Colleges of Pharmacy—Beard 503
The Department of the National Association of Boards of Pharmacy:
Address of the President of the National Association of Boards of Pharmacy—Funk 513
Proceedings of the Local Branches 518
Resolutions and Recommendations Adopted by the American Pharmaceutical Association at Its Seventy-Eighth Annual Meeting at Baltimore, Md., May 5 to 10, 1930, upon Recommendation of the House of Delegates, through Its Committee on Resolutions 522
Abstracts of Papers Read before the Sections of the American Pharmaceutical Association 526
List of the Registrants, Annual Meeting, A. Ph. A., Baltimore, Md 530
Association Business 534
Book Notices and Reviews 547
Advertising—Cover Pages 2, 3 and 4 and pp. I–XXIV.

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THE 79th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MIAMI, FLA., DATE TO BE NAMED.

The 1931 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Miami, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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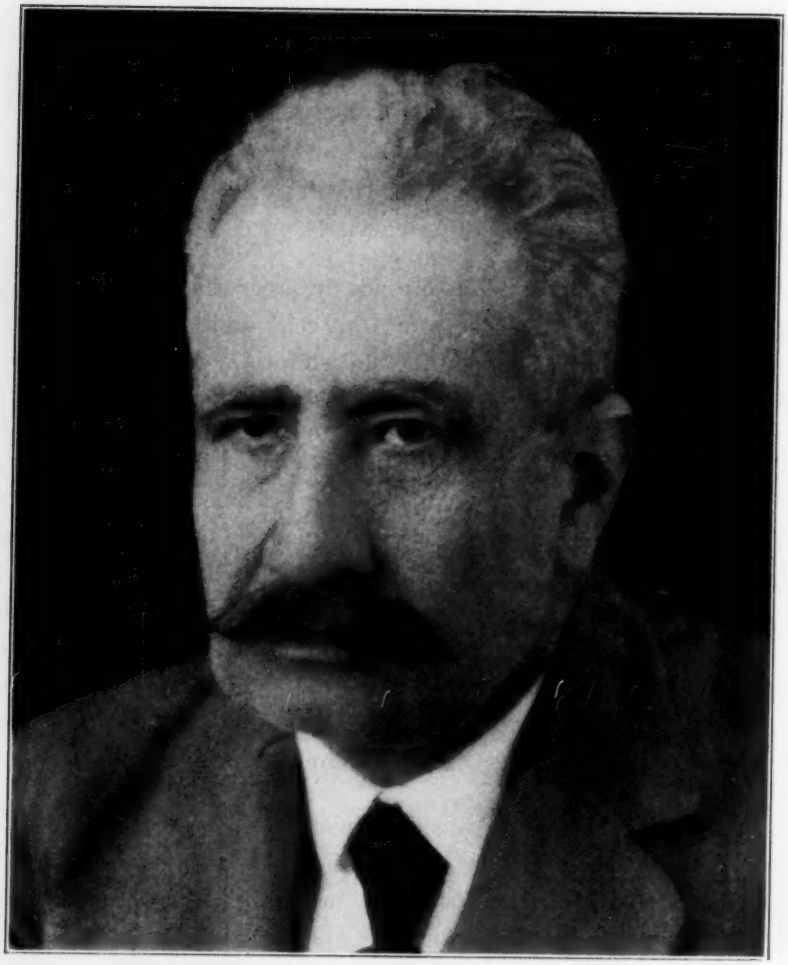
A MEMORY.

THE 78th Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, held in Baltimore during the week of May 5th, stands out as one of the most successful conventions in the history of the ASSOCIATION and, in point of attendance, the largest. There were 860 registrants and this number also speaks of the coöperation of Maryland pharmacists to honor one of their number who presided over the ASSOCIATION'S deliberations, a desire to extend the hospitalities of Maryland and of the Convention City, and gave expression to the growing interest in professional pharmacy.

Every effort was made to arrange the programs, both of business and of entertainments, to expedite business and give the visitors enjoyment and recreation, and the opportunity of deriving the benefits to be had from association meetings.

The Governor of Maryland, the Mayor of Baltimore, the departments of the City government, the Baltimore Association of Commerce, the management of the headquarters hotel and, so there may be no omission of acknowledgments, all who were invited to assist exhibited the spirit of hospitality. Using a general expression of the visitors, the warm welcome was typified by the temperature prevailing during convention week. The members of the Local Committees, under the direction of Chairman Samuel Y. Harris, successfully carried through a most interesting program.

President Christensen was duly installed and will preside at the 79th Annual Meeting to be held in Miami, Florida, in 1931. Other cities entered the contest for place, but Florida was recognized as leading in the vote before this was announced. The next opportunity for presenting claims will be in 1932, when the AMERICAN PHARMACEUTICAL ASSOCIATION meets in Canada.



JUAN MANUEL NORIEGA.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XIX MAY, 1930 No. 5

JUAN MANUEL NORIEGA.

Prof. Juan Manuel Noriega, elected an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION at the Rapid City meeting, is a graduate of the Faculty of Medicine, Mexico, which institution also conducts departments of pharmacy and of chemistry. After receiving his degree, he was appointed lecturer and laboratory assistant by his *Alma Mater*, a position held by him for sixteen years; he also engaged in the practice of pharmacy. He disposed of his pharmacy after six years of service, following his appointment as pharmacist to the Hospital de San Andres. Later, he became associated with the Instituto Medico Naçional, an institution created for the chemical and pharmacological investigation of the native flora.

In 1901, Dr. Noriega was appointed professor of the History of Drugs at the Faculty of Medicine and held that position for 26 years; from 1905–1908, he was chemist to the largest hospital of Mexico, the Hospital General and, for a year or more (1904–1905), he was also chemist to the Instituto Patologico, founded by Dr. R. Lavista; for some time he was curator of the Herbarium of the Instituto Medico Naçional, and chief of the Botanical Section of the Biological Institute (1915 to 1920). During 1920–1925, he was chief chemist to the Experimental Laboratory of the Department of Commerce, Industry and Labor. From 1927–1928 he was director in the Faculty of Chemical Sciences of the National University of Mexico, where he taught biological chemistry, chemical technology, industrial analysis, history of drugs and galenical pharmacy.

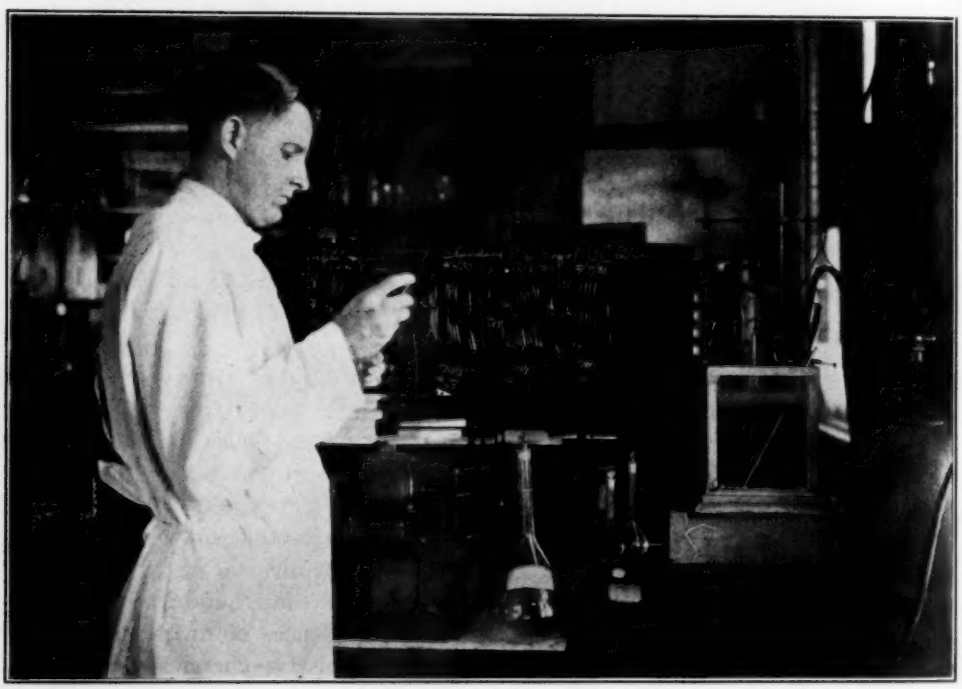
Dr. Noriega's books, "History of Drugs," and "Farmacia Galenica," are well and favorably known. He has written many interesting reports, among which, "Nature Tanning Plants," was published as a bulletin of the Experimental Laboratory of the Department of Commerce, Industry and Labor. At the present time he is teaching several subjects at the Faculty of Chemical Sciences of the National University, and conducts a private laboratory with Prof. Roberto Medellin, present

director in the Faculty of Chemical Sciences, and former Secretary-General of the Health Department.

Dr. G. G. Colin says of the subject of this brief sketch that among his personal characteristics are his great kindness and benevolence. His many students regard highly his authority as a pharmacist and chemist; he is one of the best known pharmacists of Mexico, and has been a teacher of pharmacy and of chemistry to several generations. He is a past-president of the Mexican Pharmaceutical Association and of the Mexican Chemical Society. We welcome the pharmacists of our neighbor country to membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

THE EBERT PRIZE FOR 1930 AWARDED TO MARVIN R. THOMPSON.

The Ebert Prize for 1930 was awarded to Marvin R. Thompson for his contribution on "The Pharmacology of Ergot;" the articles are published in the JOURNAL A. PH. A.; two parts are still to be printed, parts VII and VIII will be found in the "Scientific Section" of this issue.



Mr. Thompson, who is shown in his laboratory, is assistant pharmacologist of the Food and Drug Administration, U. S. Department of Agriculture.

*The Prize was established by Albert E. Ebert, of Chicago, president of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1872–1873, to be awarded for the best essay or written contribution containing an original investigation of a medicinal substance, determining new properties, or containing other meritorious contributions to knowledge; or for improved methods of determining merit, for the preparation of chemical or pharmacal products. The award is made annually, provided an essay of sufficient merit to justify the award is presented.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

THE SEVENTY-EIGHTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

REFERENCE has been made on the first page of this number of the JOURNAL to the Baltimore meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, and the comment following, also, will be a more or less general statement. In point of attendance the meeting was the largest in the history of the ASSOCIATION, and the evident interest was continuous. The addresses of the presiding officers of the ASSOCIATION, of the House of Delegates, of the American Association of Colleges of Pharmacy, of the National Association of Boards of Pharmacy and of the Council, appear in this issue. The activities of the General Sessions of the ASSOCIATION and of the House of Delegates will be published in the June number, hence the details of the transations will not be given at this time.

While incidental, it is worthy of mention that all but one of the living Ex-Presidents of the ASSOCIATION were present at the Baltimore meeting and the one missing came later to attend the Pharmacopœial Convention. Considering that eighteen are included in the above number, it speaks for a loyalty that few, if any, in other national associations have equalled. It may also be noted that the oldest Ex-President has lived more than four-score years, the youngest among them is a grandfather, and one of them arranged a trip around the world in order to reach Baltimore in time for the convention. President MacFarlane and Secretary Stanbury, of the Canadian Pharmaceutical Association, both of them members of the AMERICAN PHARMACEUTICAL ASSOCIATION, were also in attendance and shared in the work of the convention.

The program of the General Sessions was carried through in regular order and included the reports of the officers, President Dunning's address and his very interesting and encouraging report on the Headquarters Building. The program also included an address, a continuation of that from last year, on "Professional Pharmacy," by Dean Jordan, and one by President MacFarlane on "Pharmacy in Canada." President Dunning stressed pharmacy as a profession in several of the subdivisions of his address and presented a hopeful view of progress. He referred to the development of the A. PH. A. Headquarters and, later, gave a full accounting of the work which will be reported in June JOURNAL.

The annual banquet was a splendid affair, presided over by President Dunning; among the speakers were Governor Albert C. Ritchie and Mayor William F. Broening; and the presentation of the Remington Honor Medal to Dr. Edward Kremers by New York Branch, A. PH. A. was part of the evening's delightful program. A "Special" edition of the *Baltimore Sun*, featuring some of the active workers of the convention and a very much enjoyed minstrel show, well presented by the Travelers' Auxiliary of Maryland Pharmaceutical Association, featured the close of the banquet.

The officers were installed at the last General Session, under the direction of former President, L. L. Walton; They are: *President*, H. C. Christensen; *First Vice-President*, Walter D. Adams; *Second Vice-President*, D. B. R. Johnson; *Members of the Council*, H. V. Arny; T. J. Bradley; William B. Day. Prof. Elie H. LaPierre, of Cambridge, Mass., was elected *Honorary President*, and the *Secretary*, *Treasurer* and the *Editors* of the YEAR BOOK and the JOURNAL, and *Chairman of the Council*, were reëlected to the respective offices.

The nominees to be voted on by mail ballot are:

President, Walter D. Adams, Herbert M. Lerou, Robert L. Swain; *First Vice-President*, J. G. Beard, Adley B. Nichols, Samuel Y. Harris; *Second Vice-President*, J. W. Dargavel, Howard C. Newton, Earl R. Serles. *Members of the Council:* H. A. B. Dunning, S. L. Hilton, J. A. Koch, Denny Brann, Charles J. Clayton, Ambrose Hunsberger, Leonard Seltzer, A. C. Taylor, A. L. I. Winne. One is to be elected of the first group and three of the second.

The Ebert Prize was awarded to Marvin R. Thompson for his contributions on "The Pharmacology of Ergot."

The minutes of the House of Delegates will be printed in the June JOURNAL and the address of Chairman R. L. Swain is published in this issue.

The resolutions adopted at the meeting are printed in this number of the JOURNAL and *speak for their importance.* The reports of the committees evidenced the helpful spirit of the members; as these will soon be published, no further comment is made other than that in connection with the resolutions.

All of the Sections held interesting and profitable sessions; the list of new officers will be found on page X, and the abstracts of part of the papers in succeeding pages of this JOURNAL.

The entertainment features of the convention were mentioned in the April number, page 422. An historical exhibit at the Emerson proved of interest—a purpose was to impress members with the fact that although a book or historical item may have limited value—by individual contributions the contemplated historical collection, museum and library will be enhanced and made of great general usefulness and service.

The closing event of the week was the dedication of the new building of the School of Pharmacy, University of Maryland, to which those attending the convention were invited, and they were also banquet guests of the Alumni Association at Hotel Emerson that evening. The speakers at the dedication were Governor Albert C. Ritchie, Dr. Raymond A. Pearson, President of the University; Dr. Edward Kremers, University of Wisconsin; and Dean Andrew DuMez. The toastmaster at the banquet was R. E. Lee Williamson, and the speakers: The Governor, Mayor William F. Broening, Dr. D. M. R. Culbreth, Prof. J. G. Beard, University of North Carolina; Dr. A. R. L. Dohme, and J. Thomas Lyons. The interest in Maryland Pharmaceutical affairs by Governor Ritchie has been most encouraging to Maryland pharmacists and, indirectly, to all American pharmacists.

As stated at the beginning, this comment is far from complete, but many pages of transactions will be found elsewhere and others will follow in succeeding issues of the JOURNAL.

The meeting in Baltimore was pronounced a success by those who attended; Miami will be host of the ASSOCIATION next year.

THE PHARMACOPŒIAL CONVENTION OF 1930.

ELEVEN decenniums ago Dr. Lyman Spalding was rewarded for his efforts, extending over a number of years, by the completion of the first edition of the United States Pharmacopœia; this accomplishment is deserving of recognition by all who use the Pharmacopœia in practice and by those who are protected by the standard and this means that every human life in this country owes a debt to the founder, and other countries have profited thereby. On May 13, 1930, Dr. Reid Hunt, as President of the U. S. Pharmacopœial Convention, called more than 500 delegates to order for the purpose of organizing for the work of revising the U. S. P. X, and preparing the next edition of this standard.

The publication date of the JOURNAL will not permit of extended discussion of this important convention, hence little more than the names of the officers and members of the Revision Committee will be given. The addresses and reports of the officials are all of interest and evidence their painstaking work and a full realization of its importance. The statement of the Treasurer showed total assets of $121,696,83.

Officers elected for the 1930–1940 decennium are:

President, Dr. W. A. Bastedo, New York; *Vice-Presidents*, H. A. B. Dunning, Baltimore; Dr. J. F. Anderson, New Brunswick, N. J.; Edward Spease, Cleveland, Ohio; Dr. R. A. Lyman, Lincoln, Nebr.; Thomas Roach, Oklahoma City; *Secretary*, L. E. Warren, of the Department of Agriculture, Washington; *Assistant Secretary*, F. A. Delgado, of the Department of Commerce, Washington; *Treasurer*, Samuel L. Hilton, Washington, reëlected.

The members of the Board of Trustees are: J. H. Beal, Camp Walton, Fla., *Chairman*, reëlected; Samuel C. Henry, Chicago; Dr. S. Solis-Cohen, Philadelphia; E. F. Kelly, Baltimore; W. Bruce Phillip, San Francisco; *Secretary of the Board of Trustees*, W. B. Day, Chicago, reëlected.

The officers of the Committee of Revision are the following:

E. Fullerton Cook, Philadelphia, *Chairman;* A. G. DuMez, Baltimore, *First Vice-Chairman;* Dr. W. C. Edmunds, Ann Arbor, Mich., *Second Vice-Chairman;* Charles H. LaWall, Philadelphia, *Secretary.*

Members of the medical group are: Doctors F. J. G. Beardsley, O. W. Bethea, Charles L. Brown, Henry Christian, M. S. Dooley, C. W. Edmunds, Bernard Fantus, A. D. Hirschfelder, Reid Hunt, G. W. McCoy, G. B. Roth, V. F. Simpson, Isaac Starr, A. L. Tatum, E. P. Underhill, C. V. Wood, H. C. Wood, Jr.

Members of the Pharmaceutical Group are: Harry V. Arny, New York City; George D. Beal, Pittsburgh; F. E. Bibbins, Indianapolis; A. R. Bliss, Jr., Memphis; T. J. Bradley, Boston; Mortimer Bye, Cincinnati; C. E. Caspari, St. Louis; E. F. Cook, Philadelphia; W. G. Crockett, Richmond; E. D. Davy, Cleveland; A. G. DuMez, Baltimore; E. N. Gathercoal, Chicago; W. F. Gidley, Austin, Texas; L. E. Harris, Norman, Okla.; L. D. Havenhill, Lawrence, Kans.; E. V. Howell, Chapel Hill, N. C., C. W. Johnson, Seattle; C. B. Jordan, Lafayette, Ind.; J. C. Krantz, Jr., Baltimore; E. H. Kraus, Ann Arbor, Mich.; H. A. Langenhan, Seattle; J. L. Lascoff, New York City; C. H. LaWall, Philadelphia; T. R. Leigh, Gainesville, Fla.; Ernest Little, Newark, N. J.; H. C. Muldoon, Pittsburgh; C. E. Nelson, Hammond, Ind.; E. L. Newcomb, New York City; W. O. Richtmann, Madison, Wis.; W. L. Scoville, Detroit; L. A. Seltzer, Detroit; E. R. Serles, Brookings, S. Dak.; H. W. Youngken, Boston.

SCIENTIFIC SECTION

THE PHARMACOLOGY OF ERGOT: WITH SPECIAL REFERENCE TO BIOLOGICAL ASSAY AND STANDARDIZATION.

(The bibliography will follow last article of the series.)

PART VII. CHANGES OCCURRING IN CRUDE ERGOT AND FLUIDEXTRACT OF ERGOT, U. S. P. X, DURING STORAGE.

BY MARVIN R. THOMPSON.*

The preceding articles of this series have confirmed that the value of ergot in medicine is due to two alkaloids, ergotamine and ergotoxine, which differ slightly in chemical composition and solubility, but which are pharmacologically identical.

The author is not convinced that each of these alkaloids actually exist in appreciable quantities as such in the crude drug, but believes that the process of isolation employed determines whether the product will be ergotamine (Stoll) or ergotoxine (Barger) which are equally active, or whether the product will be one of negligible activity, such as crystalline ergotinine (Tanret). The following evidence is offered to support this contention:

A single lot of crude ergot was mixed, assayed biologically by the Broom-Clark Method for alkaloidal activity, and divided into three equal portions. One portion, upon suitable extraction and chemical treatment, yielded an amorphous alkaloid which compared in chemical, physical and pharmaco-dynamic properties to ergotoxine $C_{35}H_{41}O_6N_5$ (50). The amount obtained was found, upon assay by the Broom-Clark Method, to represent approximately two-thirds of the total alkaloidal activity originally present in the crude drug. The second portion, when treated essentially according to the method of Stoll for the preparation of ergotamine, yielded an amount of crystalline ergotamine ($C_{33}H_{35}O_5N_5$) which, upon bio-assay, was found to represent approximately three-fourths of the total alkaloidal activity originally present in the crude drug. The third portion, by an entirely different chemical treatment, gave a copious yield of a needle-crystalline alkaloid which proved to be the ergotinine ($C_{35}H_{39}O_5N_5$) of Tanret (51). Upon careful examination by the usual biological methods, neither the marc, mother liquor nor the crystalline ergotinine exhibited significant alkaloidal activity.

It is obvious that the crude drug could not contain approximately 66 per cent of its total alkaloidal activity in the form of ergotoxine plus an additional 75 per cent of its total alkaloidal activity in the form of ergotamine. This illustration becomes all the more conclusive when account is given to the fact that the isolation of these labile alkaloids cannot be made quantitative. A loss of 20 to 25 per cent cannot be avoided when only relatively small quantities of the drug are involved.

The disappearance of significant activity from the marc, mother liquor, etc., of the portion from which the inactive crystalline ergotinine was prepared can only be explained by the hypothesis that the active alkaloid (either ergotamine or ergotoxine) was changed chemically into the inactive alkaloid because of the method of isolation employed. The slight differences in chemical composition and behavior of these three alkaloids have been reported by Barger (3, 6) (ergotamine

* Assistant Pharmacologist, Pharmacological Laboratory, Food, Drug and Insecticide Administration, U. S. Department of Agriculture, Washington, D. C.

and ergotoxine) and Stoll (52) (ergotoxine and ergotamine). Barger found that ergotoxine (active) and crystalline ergotinine (inactive) could be changed from one to the other very easily since the crystalline alkaloid (ergotinine) is the anhydride of the amorphous (ergotoxine), as first suggested by Kraft.

Regardless of the form in which the alkaloidal activity exists in crude ergot or its galenicals, it is generally agreed that the therapeutic value of a preparation depends upon its effectiveness in producing paralysis of the motor endings or "myoneural junctions" of the sympathetic, and also the inhibitory fibers that are stimulated by epinephrine, as shown by Rothlin (31). Ergotoxine and ergotamine show practically equal activity with respect to this property, and therefore either may be regarded as being representative of the alkaloidal activity of ergot or its preparations. The Isolated Rabbit Uterus and the Cock's Comb Methods of assay measure this activity, the Rabbit Uterus Method being the more accurate of the two.

Crude ergot, or preparations thereof, must meet two requirements in order to be of medicinal value: *first*, a significant and defined amount of alkaloidal activity must be present, and *second*, this alkaloidal activity must be retained in a reasonably stable condition.

The first requirement can now be met, since sufficiently accurate methods for the estimation of alkaloidal activity are available, and since the U. S. P. X method for the preparation of Fluidextract of Ergot has been found to provide for the appearance in the preparation of practically all of the alkaloidal activity which was present in the parent drug. Before the second requirement can be met, however, the stability of the alkaloidal activity in crude ergot and in Fluidextract of Ergot must be known. Studies of this phase of the problem were therefore undertaken.

A. CRUDE ERGOT.

Previous Work on the Stability of Crude Ergot.

Forst (53) reported evidence showing that powdered ergot, when assayed by his chemical method, lost over 50 per cent of its alkaloid in six months. Burn and Ellis (54) examined a sample of whole ergot which was kept in a bottle and known to be at least fourteen years old, finding it to contain 0.075 per cent of alkaloid, which is approximately 150 per cent of the U. S. P. requirement, by the Isolated Rabbit Uterus Method of Broom and Clark. They (54) expressed a belief that ergot, if preserved in its original form, would lose very little of its activity over a period of many years.

Liptak (55) conducted experiments showing that ergot very gradually loses its activity and that, parallel with this loss in activity, there is an increase in the free fatty acid content of the fixed oil contained in the drug.

The U. S. P. and B. P. specifically require that crude ergot shall not be used if it is more than one year old, although there is no known method for determining the age of ergot by pharmacognostic, pharmaco-dynamic, or chemical examination. The author doubts the propriety of such a requirement since it has been found that ergot, if kept entire and in a dry condition for several years, continues to yield preparations and constituents entirely analogous in physiological activity to recently collected material. On the other hand, ergot stored in a damp condition rapidly undergoes objectionable changes, such as the development of mold, rancidity and fermentative or putrefactive decomposition with a resulting increase in non-specific or proteinogenous amine (histamine, etc.) formation.

EXPERIMENTAL.

The changes occurring in crude ergot due to age and storage conditions have been observed by making the following determinations in addition to pharmacognostic examinations from time to time:

1. Alkaloidal Activity.—A portion of the drug was exhausted of alkaloids by maceration and percolation with the acid-hydro-alcoholic menstruum of the U. S. P. The alkaloidal activity of the percolate was determined by the Isolated Rabbit Uterus Method (13) and checked by the Isolated Guinea-Pig Uterus Method for Alkaloidal Activity (39) and the Cock's Comb Method. Ergotamine tartrate was used as the standard for comparison.

2. Non-Specific Amine Activity.—This was carried out according to the method previously described for the determination of the non-specific amine activity of Crude Ergot (38), and checked by the usual pressor method to anæsthetized dogs. Histamine was used as the standard for comparison.

3. "Acid Number" of Fixed Oil.—The oil was extracted from a definite amount of the powdered drug by exhaustive percolation with petroleum benzine. The benzine was then driven off by exposing the percolate to a current of warm air until the weight became practically constant and the odor of benzine had disappeared. Five grams of the fixed oil was mixed in a glass-stoppered flask with 50 cc. of neutral alcohol, warmed to 50° C., and titrated with $N/10$ alkali with vigorous agitation, using phenolphthalein as an indicator. The persistence of the pink color for one minute with vigorous agitation was taken as the end-point. *The "Acid No.," in these results, is defined as the number of cubic centimeters of $N/10$ alkali necessary to neutralize the free fatty acid of ten Gm. of the fixed oil of ergot.*

CRUDE DRUG SAMPLES STUDIED.

Since Spanish and Russian Ergot constitute the two most important varieties, one lot of each was carefully selected. Both were of excellent appearance and characteristics and free from insect or mold infestation. They were also in a dry condition. The Russian lot was marked "R," and the Spanish was labeled "S."

Lot "R" was assayed and divided into three equal portions and labeled R_1, R_2 and R_3, respectively.

R_1 was ground and de-fatted with petroleum benzine, dried and stored in a loosely covered glass jar at room temperature. Twenty-two per cent of fixed oil was obtained. Due account for this loss in weight was made in subsequent determinations.

R_2 was stored in a paper bag in the crude or whole condition at room temperature in a dry place.

R_3 was stored in an air-tight glass jar, in the unground state, at room temperature.

TABLE VII.—CRUDE ERGOT "R."

Sample.	Date of exam. (plus or minus 10 days).	Known age of sample.	Alkaloidal content in terms of ergotamine tartrate,* per cent.	Non-specific amine content in terms of histamine,** per cent.	Acid no. of fixed oil.
	10-20-27	1927 crop	0.05–0.06	(−) 0.005	7.6
R_1	10-20-28	One year	0.05–0.06	(−) 0.005	..
	10-20-29	Two years	0.045–0.05	(−) 0.005	..
	10-20-27	1927 crop	0.05–0.06	(−) 0.005	7.6
R_2	10-20-28	One year	0.05–0.06	(−) 0.005	9.8
	10-20-29	Two years	0.045–0.05	(−) 0.005	12.4
	10-20-27	1927 crop	0.05–0.06	(−) 0.005	7.6
R_3	10-20-28	One year	0.045–0.055	(−) 0.005	11.7
	10-20-29	Two years	0.040–0.045	(−) 0.005	18.0

(−) Less than.

* Ergotamine Tartrate—The Sandoz Chemical Co.

** Histamine—The Pfanstiehl Chemical Co.

Lot "S" was assayed and divided into four equal portions and labeled S_1, S_2, S_3 and S_4, respectively.

S_1 was ground and stored in a loosely covered jar at room temperature.

S_2 was stored in its original from in a paper bag at room temperature in a dry place.

S_3 was stored in its original form in a sealed jar at room temperature.

S_4 was stored in its original form in a humidor container in a damp condition at room temperature.

All of these samples were examined at the end of one year, and again at the end of two years. The results obtained on Sample "R" are tabulated in Table VII, and those on Sample "S" are given in Table VIII.

TABLE VIII.—CRUDE ERGOT "S."

Sample.	Date of exam. (plus or minus 10 days).	Known age of sample.	Alkaloidal content in terms of ergotamine tartrate, per cent.	Non-specific amine content in terms of histamine, per cent.	Acid no. of fixed oil.
	10-20-27	1927 Crop	0.133	(−) 0.005	9.6
S_1	10-20-28	One year	0.09–0.10	(−) 0.005	64.8
	10-20-29	Two years	0.06–0.07	0.005	152.0
	10-20-27	1927 Crop	0.133	(−) 0.005	9.6
S_2	10-20-28	One year	0.125–0.130	0.005	17.4
	10-20-29	Two years	0.11–0.12	0.007	25.4
	10-20-27	1927 Crop	0.133	(−) 0.005	9.6
S_3	10-20-28	One year	0.12–0.13	(−) 0.005	35.6
	10-20-29	Two years	0.10–0.11	0.005	61.0
	10-20-27	1927 Crop	0.133	(−) 0.005	9.6
S_4	10-20-28	One year	0.06–0.07	0.06–0.07	37.9
	10-20-29	Two years	0.01–0.02	0.12–0.13	90.7

(−) Less than.

DISCUSSION OF RESULTS.

1. Alkaloidal Activity.—It is obvious from the results obtained from R_2, R_3, S_2 and S_3, that the loss of alkaloidal activity in whole ergot during storage over a reasonable period is not serious if the drug is kept in a dry condition. In addition to the experimental evidence to this effect contained in Tables VII and VIII, a sample of whole ergot which had been kept in a desiccator over calcium chloride for at least thirteen years at an unusually high temperature (near hot-water heating pipes) was found to have retained 0.06 per cent of alkaloid (approximately 120 per cent of U. S. P. potency) in terms of ergotamine. Since R_3 and S_3, which were stored in sealed jars, showed a very slightly greater loss in alkaloidal activity than R_2 and S_2, which were stored in bags, it is indicated that air-tight containers are certainly not necessary for storing crude ergot, and actually are to be avoided unless the drug is kept absolutely dry by a suitable dehydrating agent.

The results obtained from Sample R_1, which was ground and de-fatted before storing, and S_1, which was ground but not de-fatted, definitely show that the storage of *powdered* ergot results in an appreciable loss in alkaloidal activity unless the fixed oil is first removed. R_1 lost but a relatively small portion of its activity during two years, while S_1 lost approximately one-half of its alkaloidal activity in the same period.

S_4 was the only portion stored in the presence of moisture, or in a damp condition. This sample rapidly developed mold and a putrid, musty odor. At the end

of a year in this condition, half the activity had been lost, while in two years, only a relatively small amount of alkaloidal activity was retained.

2. Non-Specific Amine Activity.—All of the samples embraced in Tables VII and VIII were practically devoid of histamine or other active proteinogenous amines at the beginning of these studies. No significant changes in this respect occurred in the samples kept in a dry condition. Sample S_4, however, which was kept in a damp condition, rapidly developed non-specific amines which, for the most part, consisted of histamine.

3. "Acid No." of Fixed Oil.—All of the samples involved showed an increase in the free fatty acid content of their fixed oil as their respective ages increased. The "Acid Number" here described may be taken as an index of rancidity. The development of rancidity was found to be very slow if whole ergot is stored in bags in a dry place. The *powdered* drug S_1 developed rancidity to such an extent in two years that a heavy crystalline deposit of free fatty acid separated from the extracted fixed oil as the benzine was driven off. Tables VII and VIII show that the development of rancidity depends to a great extent upon storage conditions. The storage of whole ergot in open containers in a dry place is obviously preferable from this standpoint. Similarly, it is evident that *powdered* ergot must be de-fatted before storing to avoid objectionable changes in its composition.

In addition to the results contained in Tables VII and VIII, similar determinations were made upon 50 crude ergot imports for the purpose of ascertaining whether or not the "Acid Number" of the fixed oil was of value as a criterion in estimating the quality or age of the drug. The alkaloid and amine activity of these imports, together with the "Acid Number" of their fixed oil, is contained in Table IX.

TABLE IX.—THE RELATIONSHIP OF SPECIFIC ALKALOID AND NON-SPECIFIC AMINE ACTIVITY TO THE "ACID NUMBER" OF THE FIXED OIL OF IMPORTED CRUDE ERGOT.

Import P. C. No.	Consulate.	Variety.	Alkaloidal activity* in terms of U. S. P. Standard F. E., per cent.	Acid number of fixed oil.	Amine content in terms of histamine, per cent.
2001	Barcelona	Spanish	150	24.8	0.07
2003	Antwerp	?	150	14.3	0.02
2004	Hamburg	?	150	8.3	(−) 0.005
2005	Lisbon	Spanish	200	6.8	0.04
2015	Hamburg	Spanish	(=) 200	4.6	0.04
2016	Barcelona	?	100	30.8	0.08
2017	Marseilles	?	200	6.2	0.01
2019	Hamburg	Russian	50	23.7	0.05
2024	Moscow	Russian	75	27.0	0.04
2025	Moscow	Russian	80	21.1	(−) 0.005
2026	Hamburg	?	130	16.4	0.04
2031	Hamburg	?	120	8.6	0.07
2032	Brussels	?	175	4.5	0.02
2038	Hamburg	?	175	11.6	0.08
2039	Barcelona	Spanish	(=) 200	4.0	0.05
2049	Hamburg	?	175	6.5	0.08
2058	Hamburg	?	200	3.2	0.03
2063	Hamburg	?	(−) 50	13.7	0.01
2064	Hamburg	?	160	4.4	(−) 0.005
2065	Hamburg	?	160	5.2	——
2066	Barcelona	Spanish	(=) 200	6.0	0.06
2067	Hamburg	Russian	(=) 150	5.6	(−) 0.005

Import P. C. No.	Consulate.	Variety.	Alkaloidal activity* in terms of U. S. P. Standard F. E., per cent.	Acid number of fixed oil.	Amine content in terms of histamine, per cent.
2068	Dacon	?	200	6.4	0.07
2069	Hamburg	?	130	5.0	0.03
2074	Lisbon	Spanish	(=) 200	5.5	0.09
2076	Lisbon	Spanish	(=) 200	4.0	0.02
2077	Hamburg	?	200	4.8	(−) 0.005
2078	Hamburg	Russian	175	5.5	(−) 0.005
2079	Lisbon	Spanish	(=) 200	4.0	0.11
2080	Hamburg	?	130	7.7	(−) 0.005
2081	Hamburg	?	200	5.2	0.04
2083	Hamburg	?	200	5.5	0.04
2088	Hamburg	?	200	5.0	0.02
2094	Hamburg	?	200	6.0	(−) 0.005
2097	Hamburg	?	175	12.0	——
2098	Hamburg	?	(=) 200	4.0	——
2099	Moscow	Russian	100	12.0	(−) 0.005
2100	Brussels	?	(=) 200	4.4	——
2102	Hamburg	?	200	9.5	——
2104	Hamburg	?	200	12.0	——
2105	Danzig	?	100	9.5	(−) 0.005
2106	Danzig	?	133	10.5	0.01
2107	Budapest	?	100	6.5	——
2124	Lisbon	Spanish	100	42.5	0.12
2127	Vigo	?	100	24.6	0.07
2137	Hamburg	?	200	8.2	0.03
2141	Hamburg	?	(=) 200	4.2	——
2143	Hamburg	?	200	6.3	——
2151	Vigo	Spanish	(=) 200	2.6	——
2155	Hamburg	?	160	16.9	——

(=) Greater than.
(−) Less than.
* Cock's Comb Method, U. S. P.
? Origin or variety not stated.
—— Not determined.

Although the "Acid Number" of the oil of ergot was found to increase as the alkaloidal activity of the drug decreased during prolonged storage, it is evident from the results contained in Tables VII, VIII and IX that the "Acid Number" of the fixed oil conveys no indication as to the specific alkaloidal activity contained in the drug. An "Acid Number" above 15, however, does indicate a distinct rancid condition and suggests appreciable age or that the drug has been subjected to bad storage conditions.

The non-specific amine activity apparently is entirely independent of the alkaloidal activity or the "Acid Number," although a high "Acid Number" is often associated with a high non-specific amine content. If stored in a damp or moist condition in a warm place, the amine activity increases, presumably because of fermentation or putrefaction (see also Part IV (41)). The presence of mold often indicates a high histamine content, although the histamine content of some samples has been found to increase in the absence of mold. The presence of moisture is necessary for the development of either mold or non-specific amines, and can be effectively prevented by storage in a dry condition.

THE RELATION BETWEEN PHARMACOGNOSTIC CHARACTERISTICS AND THE QUALITY OF CRUDE ERGOT.

It is very difficult to express distinguishing pharmacognostic characteristics of different samples of ergot. This subject, therefore, must of necessity be treated more or less generally, and embraces conclusions drawn from the author's experience in the pharmacologic and pharmacognostic examination of over 200 samples of all varieties.

1. EXTERNAL APPEARANCE.

(*a*) *Color and Surface Markings.*—The surface color of the sclerotia varies from a light grayish purple or brown to a purplish black. The surface of the grains is usually fissured and furrowed longitudinally, although some samples are quite smooth. The various varieties show no significant differences which are of value in judging the amount of activity present.

(*b*) *Shape and Contour of Sclerotia.*—Longitudinal curvature and tapering or cross-section outline are not significant in determining the variety or quality of the drug.

(*c*) *Size of Sclerotia.*—Considerable variation size of grains is shown in all samples. The smallest grains of given samples usually have been found to show as great an amount of alkaloidal activity as the larger grains, although individual samples composed of the larger grains usually exhibit more alkaloidal activity than those composed of uniformly smaller sclerotia. Separation studies of single samples often lead to erroneous conclusions because of the samples being composed of mixtures of different lots. The grains of the Spanish or Portuguese varieties are usually larger than those of the Russian, Polish or German varieties, although occasional exceptions are found.

2. ODOR.

The odor of crude ergot varies with different samples. Some are almost odorless, some have a soapy, unpleasant odor, while others evolve a pleasant, fruity, aromatic odor. It is most evident in the ground condition. Samples containing the greatest amount of alkaloidal activity usually give off a very appreciable amount of the pleasant aromatic odor. Odorless samples, or those having the soapy odor with a suggestion of pungency or rancidity, are usually found to be relatively low in potency.

3. FRACTURE.

The fracture of the sclerotia has been found to be one of the most significant criteria as to the quality of ergot.

(*a*) *Ease and Shortness of Fracture.*—The most potent samples are composed of sclerotia which break easily with a short, corky fracture. Those having a tough, horny fracture are of poorer quality with respect to activity. The presence of an appreciably damp condition causes all varieties to show a somewhat rubbery fracture, thereby detracting from the significance of this test.

(*b*) *Texture of Fractured Surface.*—The smoothness or roughness of the fractured surface is not significant of the quality because of the influence exerted by the presence of moisture.

(*c*) *Color of Fractured Surface.*—The best quality is denoted by a white or yellowish white color. Appreciable amounts of bluish, purplish or brownish tint is indicative of poorer quality from the standpoint of activity. These tints usually increase in intensity with the age of the sample.

4. GRINDING CHARACTERISTICS.

(*a*) *Ease of Grinding.*—This criterion of quality is closely related to the ease of fracture. Samples containing a high degree of potency are reduced to a powder much more easily than those of poor quality.

(*b*) *Texture of Powdered Drug.*—A soft, mealy texture of the coarsely powdered drug is to be preferred. The fragments of ground ergot of poor quality are usually sharp and angular, giving the powder a rough texture. The difference is best detected by rubbing the powder between the fingers.

(*c*) *Color of the Ground Ergot.*—The color of different samples of powdered ergot varies from a light purplish gray to a grayish brown. A predominance of brown is to be preferred. The purplish gray color is characteristic of the poorer quality samples of Russian and Polish Ergot.

5. FIXED OIL.

(*a*) *Quantity.*—The quantity of fixed oil can be determined by de-fatting in the usual manner, and driving off the benzine by distillation or by exposing to a current of air until the weight becomes constant. The amount contained in ergot varies from 10 to 35 per cent. The best quality is usually indicated by a high fixed oil content, although the age of the sample must also be considered.

(*b*) *Color.*—The color of the extracted oil varies from a very light amber to a dark amber. This color has not been found to be a significant indication of the potency of the drug, although a deep amber color has been found to indicate appreciable rancidity (a high "Acid Number" or "Free Fatty Acid" content).

6. EXTRACTIVES OBTAINED DURING PREPARATION OF FLUIDEXTRACT, U. S. P.

Although the active principles of ergot have been found to represent but a small portion of the extractable material contained in ergot (48), which imparts the dark color to fluidextracts, the color of the percolate is usually quite significant. Samples containing relatively low potency usually yield a percolate which is relatively transparent and which shows a predominance of red coloration. The more potent samples yield a percolate in which a rich brown color predominates instead of red, and which is comparatively much deeper in color and of greater "total solid" content. These characteristics have been found to be true only at the time of percolation or preparation of the fluidextract. Changes in the color rapidly take place during storage, with a result that all types and qualities have a tendency to assume similar appearances.

7. MOLD AND INSECT INFESTATION.

(*a*) *Insect Infestation.*—The author has examined samples of ergot from time to time which had been literally alive with mites and lice for many months. No significant changes in the activity of fluidextracts of these insect-infested samples were observed. Nevertheless, insect infestation is decidedly objectionable from other obvious points of view. The use of small amounts of carbon disulphide naphthalene or carbon tetrachloride can be made to prevent this condition without appreciably interfering with the activity of the drug.

(*b*) *Mold.*—Moldy conditions are equally objectionable. The presence of moisture is essential to mold development. Whether the mold is present or not, moisture increases the rate of deterioration of the alkaloidal activity and has a tendency to cause an increase in proteinogenous amine formation, especially in a warm temperature.

8. CHOICE OF VARIETIES.

Much dispute is found in the earlier literature with respect to this point. The most important varieties of Ergot of Rye include Spanish, Portuguese, Russian and Polish. Different samples of Spanish and Portuguese ergot have been found to yield alkaloidal activity ranging from 0.05 to 0.30 per cent in terms of ergotamine or ergotoxine, while the alkaloidal activity of Russian and Polish varieties examined were found to vary from 0.02 to 0.10 per cent in terms of ergotamine or ergotoxine.

Since the therapeutic value of ergot depends upon its alkaloidal activity, the Spanish and Portuguese varieties are to be preferred. From the qualitative standpoint of physiological activity, however, the different varieties have exhibited no distinguishing characteristics. *Therefore, if Russian or Polish samples are found to contain a satisfactory amount of alkaloidal activity by*

the usual biological tests, their resulting standardized fluidextracts are equal in quality to those prepared from other varieties.

B. FLUIDEXTRACT OF ERGOT, U. S. P. X.

Previous Work on the Stability of Fluidextract of Ergot.

It has been known for many years that ergot preparations lose their activity upon standing. The rate and factors which influence the rate of deterioration constitute a much disputed subject.

The U. S. P. requires that the Standard Fluidextract of Ergot be aged for six months prior to final standardization because a thought holds sway among investigators in this country that the most rapid deterioration of potency takes place during this period, after which a greater degree of stability is manifest.

Prybill and Maurer (56) examined liquid extracts prepared by five different pharmacopœial processes, in which they found that only the U. S. P. X and the D. A. B. VI extracts exhibited a significant amount of alkaloidal activity. Turning to the stability of these extracts, they found that the alkaloidal activity of the German Pharmacopœial preparations deteriorated at a more rapid rate than that of the U. S. P. X Fluidextract, but that even the U. S. P. preparations lost half of their activity in forty-eight weeks.

Wokes (57) reported extensive research showing that all types of the usual liquid and semi-solid extracts of ergot rapidly lose their activity on keeping, concluding that the " . . . rate of deterioration is influenced by the temperature at which the liquid extract is stored, being about twice as rapid at room temperature as in the ice chest, and still more rapid in the incubator at 37° C. Even under the best conditions, however, half the activity is lost in two or three months . . . . ," and that " . . . . concentrated (soft) extracts of ergot are rather more stable. When stored in the ice chest they retain half their activity for four to nine months."

The author, in a preceding article (42), showed that deterioration of the alkaloidal activity of Fluidextract of Ergot, U. S. P. X, was not nearly as rapid as is stated by Wokes *provided that the preparation is protected from excessive exposure to air.* Results obtained upon ten samples of fluidextracts at various intervals for nine months showed that while the rate of deterioration is somewhat more rapid during the first two or three months after preparation, approximately two-thirds of the activity was retained at the end of nine months in most instances. It will be noted that these samples were kept in completely filled, tightly sealed bottles in a cool place protected from light. Portions were drawn for assay by inserting a fine hypodermic needle through the stopper, and immediately re-coating the seal with wax.

Stoll and Rothlin (9), in 1927, reported evidence showing that exposure to air or oxygen quickly destroyed the activity of the ergot alkaloids.

Swanson (34) recently reported evidence indicating that the hydrogen-ion concentration factor influenced the rate of deterioration of ergot activity. A lack of acidity was found to result in an increase in the rate of deterioration.

EXPERIMENTAL.

Ten 500-Gm. portions of crude ergot were carefully selected from recent importations. These portions were mixed, ground, de-fatted and converted into five liters of Fluidextract of Ergot by the U. S. P. X process. This preparation was biologically assayed for alkaloidal activity

by the U. S. P. Cock's Comb Method, and found to contain between 0.1 and 0.12 per cent of alkaloid in terms of ergotamine tartrate (Sandoz Chemical Co.). Pressor and Isolated Guinea-Pig Uterus experiments (38) showed that practically no non-specific amines were present.

This fluidextract was divided into suitable portions and stored as indicated below.

B (1) was stored in a clear-glass, completely filled, cork-stoppered bottle at room temperature on a laboratory shelf. The cork was removed at three-month intervals for the time necessary to draw a portion for assay.

B (2) was stored in a completely filled, cork-stoppered, amber-colored bottle and was subjected to the same conditions as B (1).

B (3) was kept in a half-filled, amber-colored, cork-stoppered bottle under the same conditions as B (1) and B (2).

B (4) was kept in an amber-colored, half-filled, cork-stoppered bottle in a refrigerator. The cork was removed at three-month intervals only for the time necessary to remove portions for assay.

B (5) was kept in a completely filled amber-colored bottle under the same conditions as B (4).

B (6) was kept exposed to air in an unstoppered, amber-colored bottle under laboratory conditions. Evaporation was corrected for by bringing to the original volume with diluted alcohol.

B (7) was kept exposed to air in an unstoppered bottle, in a refrigerator.

B (8) was sealed in hard-glass 5-cc. ampuls *in vacuo* and kept at refrigeration temperature.

The bottles which were completely filled were kept so during the entire time of the experimentation by the addition of glass beads at the time of removal of portions for assay.

Most of the assays were carried out by the Cock's Comb Method, which has been shown to be reasonably accurate in measuring the alkaloidal activity in the absence of high proportions of non-specific amines (42). Occasional check determinations were made by the Isolated Rabbit Uterus Method (28) and the Isolated Guinea-Pig Uterus Method for alkaloidal activity (39), especially during the last two 3- or 4-month intervals for each preparation. Ergotamine tartrate was used as the standard throughout the entire experiment, because this crystalline alkaloid was known to be constant in composition and potency.

The potency of all eight of the samples was determined at the intervals indicated, until they were found to be practically inert. The results are given in Table X, in which the potency of the preparations is expressed in per cent, taking 0.50 mg. of ergotamine tartrate per cc. as 100 per cent.

TABLE X.—THE DETERIORATION OF FLUIDEXTRACT OF ERGOT UNDER VARIOUS CONDITIONS OF STORAGE.

	Oct. 20, 1927.	Per Cent Alkaloidal Activity* at Age of:					
F. E. no.	Freshly prepared.	3 months.	6 months.	9 months.	12 months.	16 months.	20 months.	24 months.
B (1)	200–250	150–170	125–150	80–90	50–60	20–30	Inert**	———
B (2)	200–250	150–170	125–150	90–110	60–80	40–50	20–25	Inert**
B (3)	200–250	100–125	60–75	20–30	Inert**	———	———	———
B (4)	200–250	130–150	90–110	50–70	40–50	25–35	Inert**	———
B (5)	200–250	175–200	160–180	150–170	130–160	125–135	100–125	70–90
B (6)	200–250	Inert**	———	———	———	———	———	———
B (7)	200–250	50–75	Inert**	———	———	———	———	———
B (8)	200–250	———	200–225	———	175–210	———	———	160–180

* 0.05 per cent Ergotamine Tartrate taken as 100%.

** "Inert" indicates a potency of less than 20%.

DISCUSSION OF RESULTS OF TABLE X.

The results obtained conclusively show:

(*1*) That exposure to air is the most important of the factors which hasten the deterioration of the specific alkaloidal activity of Fluidextract of Ergot;

(*2*) That storing in a refrigerator decreases the rate of oxidation and subsequent destruction of the ergot alkaloids;

(*3*) That the rate of deterioration is somewhat more rapid during the first three months, after which a slower and more constant rate is shown; and

(*4*) That even if the preparation is kept in partially evacuated ampuls, a slight, but definite loss in activity cannot be avoided.

This evidence immediately suggests that the most satisfactory fluidextract may be marketed by preparing as described in the U. S. P. X process, but concentrating the exhaust percolate (obtained after the reserve portion) *in vacuo* at a low temperature. The finished preparation should then be aged for a period of three months in completely filled glass or glass-lined containers in a refrigerator or cold room. At this point, the preparation must be assayed for alkaloidal activity or content, the hydrogen-ion concentration must be determined, and the preparation standardized to the correct potency as near to the time of shipment as possible. If dilution is necessary, the diluent must be composed of diluted alcohol, acidified with hydrochloric acid to the same hydrogen-ion concentration as was found in the preparation.

Fluidextract of Ergot must be stored in well-filled, tightly-stoppered, glass containers in a refrigerator. Even under these conditions the stability is not as great as that indicated by B (5) of Table X, unless the containers are kept completely filled at all times, or any space in the bottle above the liquid is occupied by an inert gas such as nitrogen or carbon dioxide. Since the latter condition cannot be provided commercially, or by the dispensing pharmacist, the activity of Fluidextract of Ergot which has attained an age of more than one year from the date of assay and standardization will be far too uncertain to be of clinical value. If kept in ampuls, sealed *in vacuo*, the greater part of the activity will be retained for over two years.

PART VIII. A CONSIDERATION OF BIO-ASSAY STANDARDS FOR ERGOT AND ITS PREPARATIONS.

An ideal standard for the biological assay of crude ergot or its preparations must meet two fundamental requirements. *First*, its pharmaco-dynamic activity must be representative of the clinically desirable activity of ergot; and, *second*, it must be constant in activity and composition.

It has been demonstrated both pharmacologically and clinically that the desirable activity of ergot is due to the specific alkaloids. Several reasonably accurate biological methods are now available for the estimation of this alkaloidal activity (see preceding articles of this series), besides at least one chemical (colorimetric) method, which has been reported by Van Urk (36). All of these methods, whether biological or colorimetric, require the use of a standard for comparison.

THE RELATIVE APPLICABILITY OF STANDARDS NOW IN USE.

1. The Official Standard of the U. S. P.

The U. S. P., tenth revision requires the use of a fluidextract, prepared by the official process therein described as the bio-assay standard for crude ergot and Fluidextract of Ergot.

To avoid individual potency variation of different lots of crude ergot the U. S. P. requires that this Standard Fluidextract shall be a composite, representing at least ten different lots of ergot conforming to the official botanical description. This fluidextract is to be aged for at least six months, then standardized by the official Cock's Comb Method, and preserved in vacuum.

The experimental studies of this investigation have resulted in conclusive evidence to the effect that the procedure specified for the preparation of the U. S. P. Standard Fluidextract results in one which owes its activity to a significant specific alkaloidal content, and that no detectable amount of histamine or other non-specific amines are present. In other words, this standard meets the first one of the two fundamental requirements enumerated in the first paragraph of this article. Just how completely this standard satisfies the second requirement of an ideal standard, *i. e.*, that of constancy and stability, will next be considered.

Since individual lots of crude ergot conforming to the U. S. P. botanical description show enormous differences in alkaloidal potency, it is a foregone conclusion that it would be impossible to prepare different lots of fluidextract which would be identical in potency. Therefore, the U. S. P. directs that, in the preparation of the Standard, the aged fluidextract shall be standardized by the official Cock's Comb Method before being preserved in air-tight containers *in vacuo*.

Gittinger and Munch (15), Pattee and Nelson (28), and the present writer (42) have shown that even a reasonable degree of accuracy in the estimation of the alkaloidal activity of Fluidextract of Ergot by the Cock's Comb Method cannot be attained unless the individual reactions of the cockerels to a preparation of known potency had previously been determined. Since no ergot preparation of known potency was available at the time of the preparation of the first U. S. P. Standard Fluidextract, the indvidual "thresholds" (15) of the cockerels involved was not known. Therefore, the preparation could be standardized only by adjusting the potency such that 0.5 cc. per Kg. would produce a satisfactory bluing in the *majority* of a series of cockerels of U. S. P. specifications. In the light of present knowledge, such procedure could result in only an approximate estimate of the potency, indicating that the actual value was between 0.04 and 0.06 per cent of alkaloid in terms of either ergotamine or ergotoxine. It is obvious that greater accuracy was hardly necessary for the first standard since the adopted potency factor was purely arbitrary, and was intended to represent that of a good quality, therapeutically active Fluidextract of Ergot. The individual "threshold doses" of cockerels could then be determined, and the task of adjusting the potency of succeeding lots of Standard would present no difficulties, *provided that the first lot had been absolutely stable after being sealed in ampuls in vacuo*.

The author, in the preceding article (49), has shown that fluidextract is not absolutely stable even when kept in partially evacuated ampuls, although the loss in potency over a reasonable period (one year or less) is not great.

The specific ergot alkaloids ergotamine and ergotoxine have been available in their pure state for several years. Since their appearance, some very definite information has been obtained with respect to the strength of the U. S. P. Standard. Pattee and Nelson (28) found U. S. P. Standard Fluidextract, Lot No. 635,[1] to contain 0.045 per cent of alkaloid in terms of ergotamine base, by both the Broom-Clark Rabbit Uterus Method and the Cock's Comb Method. This lot (635) which is now over four years old, has been very carefully assayed (February 1930) by the author, using the same methods, and found to contain less than 0.02 per cent alkaloid in terms of ergotamine base. Lot No. 636[1] of the Standard Fluidextract replaced Lot No. 635 over two years ago. Lot No. 636 has been carefully and recently assayed by the author, by Dr. J. H. Burn of the Pharmaceutical Society of Great Britain, and by Dr. M. I. Smith of the Hygienic Laboratories of the U. S. Public Health Service, all agreeing that Lot No. 636 contained certainly not more than 0.03 per cent of ergot alkaloids in terms of either ergotamine or ergotoxine, while many assays have indicated that the actual alkaloid content does not exceed 0.025 per cent.

The results obtained in this investigation have conclusively shown that a fluidextract containing only 0.03 per cent of ergot alkaloids will not consistently produce a satisfactory cock's comb reaction in doses of 0.5 cc. per Kg. unless the susceptibility of birds has been increased due to frequent usage (41, 42). Since the standard did produce the correct reaction at the time it was sealed in ampuls, it can only be concluded that a loss in potency has occurred. The values given for Lots 635 and 636, together with the results reported in a preceding article (49) confirm this

[1] Lot number applied by the U. S. Department of Agriculture.

conclusion, and indicate that both Lot Nos. 635 and 636 contained approximately 0.05 per cent of ergot alkaloids at the time they were ampuled.

At the present time Standard Fluidextract of Ergot No. 2160[1] has replaced No. 636. This new lot of standard has been found to contain 0.05 per cent of ergot alkaloids in terms of ergotamine base by the use of the official Cock's Comb Method (15), the Broom-Clark Rabbit Uterus Method (28), and the Isolated Guinea-Pig Uterus Method for the estimation of ergot alkaloids (39).

It is evident that the U. S. P. Standard for the bio-assay of ergot and Fluidextract of Ergot does not fully meet the second fundamental requirement stated at the beginning of this article, although by preparing a new lot of this standard every eight or ten months, the very slight change in potency would not constitute a great objection.

2. The Use of Ergotamine or Ergotoxine as a Standard.

Both of these specific alkaloids have been found to be entirely representative of the desirable activity of ergot (see preceding articles of this series) by all of the known methods of study. Therefore, either one of these alkaloids meet the first requirement of an ideal standard.

As to constancy and stability, both apparently are superior to the present U. S. P. Standard Fluidextract. Ergotoxine is now available as the ethanesulphonate and phosphate, and ergotamine as the tartrate and the methanesulphonate. The author has no information concerning the stability of the ergotoxine salts, but has found that three ampuls each of crystalline ergotamine tartrate and methanesulphonate which were known to be at least five years old have remained identical in potency, solubility and appearance with samples recently obtained, thereby indicating practically absolute stability during five years.

The potencies of ergotamine and ergotoxine are identical for all practical purposes. Pattee and Nelson (28) and Swanson (34) agree that ergotoxine is slightly more active than ergotamine, but that, even by the Broom-Clark Method, a great number of determinations must be made before the slight difference in potency becomes evident. The actual difference, therefore, is practically no greater than that of experimental error in the Broom-Clark Method, and cannot be conclusively demonstrated by the less accurate Cock's Comb Method.

The solubilities of the salts of these two alkaloids differ appreciably. The ergotoxine salts are very difficultly soluble, yielding a colloidal suspension with water. A clear, true solution results only when an appreciable amount of dilute acid (hydrochloric, phosphoric, etc.) or alcohol is added. The salts of ergotamine are definitely crystalline and yield clear aqueous solutions readily and without trituration if a mere trace of hydrochloric acid is added. Solutions of both alkaloids are prone to deterioration, the rate and influencing factors of which are identical to those described in a preceding article for Fluidextract of Ergot (49).

The use of either ergotamine or ergotoxine as a bio-assay standard for ergot would, therefore, present no advantages over the present standard unless they were employed as the dry substances. As such, either of these alkaloids fully meet all of the requirements of a suitable standard, since they are representative of the therapeutic activity of ergot, they are definite chemical compounds of known composition, they are stable in the dry condition and fresh solutions of known potency can be easily prepared.

The Pharmaceutical Society of Great Britain has adopted ergotoxine phosphate as the standard for ergot preparations. This substance is undoubtedly satisfactory in this connection, but it is believed that ergotamine tartrate offers distinct advantages over ergotoxine phosphate or ethanesulphonate in that it is definitely crystalline and is more easily placed in perfect aqueous solution.

THE SELECTION OF A SUITABLE POTENCY REQUIREMENT FOR FLUIDEXTRACT OF ERGOT, U. S. P.

The Pharmaceutical Society of Great Britain has recently adopted a potency requirement of 0.05 per cent ergotoxine phosphate for Liquid Extracts of Ergot, and

does not grant a certificate to any product which does not meet this standard (58). Patee and Nelson (28) expressed a belief that this value constitutes a suitable potency for Fluidextract of Ergot from the standpoint of the clinician as well as the manufacturer. Bourne and Burn (59) found that the effective hypodermic dose of ergotamine or ergotoxine in obstetrics is between 0.5 and 1.0 mg. Since oral doses usually must be somewhat larger because of the absorption factor it is believed that at least 1.0 mg. of alkaloid should be contained in a dose of fluidextract. A 0.05 per cent alkaloid content corresponds to 0.5 mg. per cc. Therefore, this value provides for an alkaloid content of 1.0 mg. in the U. S. P. dose of Fluidextract of Ergot.

As a result of a thorough review of ergot literature and because of the results obtained in this investigation, the author agrees that an alkaloid content of 0.05 per cent, in terms of either ergotamine or ergotoxine base, in Fluidextract of Ergot provides for a therapeutically active preparation which will be satisfactory to the physician. Because of his experience in biologically testing practically all lots of crude ergot imported during the past two years and in testing fluidextracts marketed by practically every manufacturer in this country, the author is confident that Fluidextract of Ergot of this potency can be satisfactorily prepared from the crude ergot now available.

(*To be continued*)

A PHARMACEUTICAL STUDY OF HYDRASTIS CANADENSIS.

BY RUBY HIROSE AND H. A. LANGENHAN.

(*Continued from p. 353, April Issue.*)

ASSAY AND PURITY RUBRIC.

The 1900 U. S. Pharmacopœia (1) was the first to introduce either a purity rubric or an assay. The rubric read, "not less than 2.5 per cent of Hydrastine." The 1910 revision (2) introduced a limit of leaves, stems and foreign matter and changed the alkaloidal requirement to, "not less than 2.5 per cent of ether-soluble alkaloids." The revision of 1920 (3) added to this, "and not more than 3 per cent of acid-insoluble ash."

The assay method introduced into the revision of 1900 (4) consisted of macerating 15 Gm. of Hydrastis No. 60 powder with 150 cc. of ether and 5 cc. of ammonia water for one-half hour; then adding 15 cc. of water to cause the drug to agglutinate, and decanting 100 cc. of the supernatant liquid. The ethereal liquid is extracted with several portions of aqueous sulphuric acid solution; the combined acid solutions made alkaline with ammonia water and extracted with ether. The combined ether extractions evaporated to a constant weight at 100° C. The revision of 1910 followed the same procedure except that the quantity of drug used is 10 Gm., instead of 15 Gm.; and 100 cc. of ether is added; then decanting 50 cc. This procedure is also included in the 1920 revision of the U. S. P.

With no distinct change in the assay process as given in the revisions of 1900 and 1910, it may be assumed that the results obtained were "ether-soluble alkaloids" and not Hydrastine as specified by the 1900 revision.

Methods for assaying Hydrastis appeared sometime previous to 1900. One of the first methods is found in the Eclectic Dispensatory (5) (1862).

The Hydrastis root was extracted with alcohol, the tincture evaporated and the residue mixed with water. The whole was filtered and a quantity of hydrochloric acid added to the mixture. On evaporation, a crystalline precipitate was obtained, which on drying turned yellow. Microscopic examination showed their prismatic shape. This was assumed to be pure Hydrastin. The alkaline nature of the substance was confirmed by the Varrentrapp method for nitrogen determination.

Lercher (6) (1878) extracted the alkaloids by simply preparing a cold water solution of the drug, strongly acidulating with hydrochloric acid to precipitate out the berberine. Then alkalinizing the mother liquor with ammonia. Hydrastine was precipitated out and recrystallized from alcohol.

Moerk (7) (1894) extracted the powdered Hydrastis with ammoniacal ether and purified the alkaloid by washing out with dilute hydrochloric acid, with subsequent extraction of the alkaloid with ammoniacal ether and alcohol mixture. The ether present in small amount facilitated the crystallization.

Eberhardt (8) (1889) moistened the drug first with dilute hydrochloric acid, extracted with water, then alkalinized with dilute ammonia solution, filtered and the precipitated alkaloid, was dissolved in the smallest amount of hot chloroform. This solution was filtered through glass wool and mixed with excess of cold alcohol. Hydrastine crystallized out on stirring or shaking the mixture.

Thompson (9) (1893) determined both the Hydrastine and the berberine content. He percolated the crude drug with hot alcohol for about two to three hours. The alcoholic solution was diluted to 100 cc. with the same menstruum. To an aliquot portion, a mixture of hydrochloric acid, sulphuric acid and ether were added. This was allowed to stand twenty-four hours in a cool place. The resulting crystals were transferred to a counterpoised filter-paper. The berberine alkaloid washed with ether and alcohol mixture and dried. The weight multiplied by 0.9017 gave the berberine content, and when multiplied by forty gave the percentage. For Hydrastine, the neutral filtrate is mixed with "treated" sawdust, this is dried, placed in a flask and Modified Prolliu's Mixture was added (25 cc. of ether, 100 cc. chloroform, 25 cc. alcohol, 10 cc. of stronger ammonia water). After shaking for several hours, 50 cc. of the ethereal liquid was evaporated to dryness, then redissolved in $N/100$ sulphuric acid. The excess acid was determined with $N/100$ ammonia water. Each cc. of $N/100$ sulphuric acid represent 0.00383 Gm. of Hydrastine. This multiplied by forty equals the per cent in the drug.

Keller (10) (1894) extracted the crude alkaloids by using a mixture of 4 cc. of ether and 8 cc. alcohol and 20 cc. water. After heating for twenty-four hours Hydrastine crystallized out. Berberine was precipitated from the mother liquor as the tri-iodide or a nitrate.

The British Pharmacopœia (11) (1901) offered a standard assay of Hydrastis consisting of percolating the drug forty-eight hours with acid alcohol containing a little glycerin. The percolate concentrated in vacuo, then diluted with water containing two per cent sulphuric acid and five per cent potassium iodide. An aliquot portion filtered and alkalinized, the alkaloid extracted with ether chloroform mixture (three to one), and evaporated. A few drops of chloroform were added with $N/40$ acid; the chloroform removed by blowing air through it, and the excess acid titrated with a standard alkali.

Gordin and Prescott (12) (1899) favored the determination of Hydrastine by the periodide method. The drug is macerated over night with ammoniacal ether containing a little alcohol. Current of air is passed through to remove the ammonia. The drug is subjected to Soxhlet extraction using absolute ether, until completely extracted. The ether is evaporated spontaneously. The residue is dissolved in acidulated water to make 100 cc., 20 cc. of the filtered solution is accurately measured (2 Gm.) into a flask containing 20 to 30 cc. of standard iodine solution. From the amount of iodine consumed the amount of Hydrastine can be determined by using the factor of the hexiodide, that is 0.60403 of Hydrastine for every cc. of iodine solution used. The berberine is precipitated with acetone as the insoluble berberine acetone, this in turn is decomposed with $N/20$ potassium iodide. The solution is filtered and the excess determined with standard silver nitrate solution; residual titration with $N/40$ ammonium sulphocyanate

using ferric alum indicator. One cc. of $N/20$ KI used is equivalent to 0.016725 of berberine.

Schreiber (13) (1901) utilized the Soxhlet for extracting with ether. Best samples yielded 4.16% and the poor samples yielded 2.185% of Hydrastine by this method.

Hankey (14) (1906) in commenting on the U. S. P. assay doubts the advisability of using aliquot parts of ether solution. He also states that the alkaloid Hydrastine was never isolated white, as the yellow alkaloid was always present in sufficient amounts to give the yellow color.

Lyons (15) (1920) states that Hydrastine can be determined by saponification with hydriodic acid (sp. gr. 1.71) in a Benedik apparatus. One gram of Hydrastine is equivalent to 1.248 Gm. of silver iodide.

Herron (16) (1918) concludes that leaves and tops are most valuable since they contain less berberine than Hydrastine. Both ether and benzol are recommended for solvents in extraction by percolation.

Schmidt (17) (1920) exhausted the root by percolation with ammoniated benzol for twenty-four hours and re-crystallizing the alkaloid from alcohol.

Fromme (18) (1903) exhausted Hydrastis root with a mixture of ether, petroleum ether and ammonia as a means of obtaining the hydrastine.

Davis (19) (1915) concludes from his examination of Hydrastis, that the results obtained by the German assay are the best; the Belgian method is fairly good; the Hungarian not so good and that the Dutch, French and Swiss, also the U. S. P. IX are not practical. However, U. S. P. equals the German in accuracy if alcohol is evaporated before shaking out with ether to prevent taking up too much plant extractives. Belgian and German methods are accurate for determining Hydrastine in rootstocks.

Wattiez (20) (1920) used silicotungstic acid for isolating Hydrastine from the powdered rhizome by first refluxing with alcohol at 70°, precipitating the berberine with hydrochloric acid after one hour's standing. For Hydrastine, 5% solution of silicotungstic acid is added and the mixture is boiled. After standing twenty-four hours, the crystals are washed and calcined to constant weight. The resulting weight multiplied by 28.57 gives the weight of Hydrastine in 100 Gm. of the original powder.

An International assay of Hydrastis (21) (1921) dissolves the dried aqueous extract in $N/10$ hydrochloric acid and measuring the excess acid with $N/10$ sodium hydroxide, using methyl orange as an indicator. Each cc. of hydrochloric acid is equivalent to 0.0383 Gm. of Hydrastine.

Mackie and Cleary (22) (1923) comment on the separation of Hydrastis alkaloid by the difference in the solubilities of the hydriodides. Precipitation of berberine iodide is a time reaction and is not complete. The dilution given by the British Pharmacopœia for difference in solubilities of the iodides is an optimum. Therefore, the official assay is not based on their solubilities as believed before, but in the difference of solvents. Hydrastine is precipitated by ammonium hydroxide, but soluble in excess, and berberine is insoluble in ether. After the Hydrastine has been removed from the alkaline solution, berberine is extracted with strong hydrochloric acid or precipitate as the insoluble acetone salt.

Wasichy and Joachimowitz (23) (1919) assayed berberine in the drug grown in Austria. The powdered drug is macerated for forty-eight hours with 95% alcohol. To an aliquot portion of the extract an excess of the Mayer's Reagent is added and the whole filtered. The precipitate is washed with water containing a little Mayer's Reagent, and then transferred into a separatory funnel. Sodium chloride and ether are added and the mixture is shaken for thirty minutes. To 100 cc. of the clear berberine chloride solution an excess of ether solution of picrolonic acid is added. The precipitate of berberine picrolonate is collected in a Gooch crucible and dried to constant weight at 100° C. Relation of berberine picrolonate to berberine is as 600.25 is to 353.26.

Davis (24) (1915) precipitated out the berberine with ethyl acetate, liberating the berberine with 10% sodium hydroxide and finally shaking it out with ether-chloroform mixture.

The assay of Hydrastis has not been limited to the drug itself, but also applied to the fluidextract and the tincture. The U. S. P. (1910) assay for fluidextract directs the use of 10 cc. of the fluidextract mixed with 85 cc. of distilled water containing 2 Gm. of KI., water added to make 100 cc., and the mixture shaken several minutes; 50 cc. of the mixture are placed in the separatory funnel, alkalinized with ammonia water and the alkaloid shaken out with ether. When

dried and weighed, the residue should weigh 0.2 Gm. equivalent to 2 Gm. of ether-soluble alkaloid in 100 cc. of the fluidextract.

Simon (25) (1885) determined Hydrastine in the fluidextract by adding ether and ammonium hydroxide to the extract which had been previously warmed to remove the excess alcohol. To the tincture, he added water to separate the oil and the resin before isolating the alkaloid. Eberhardt (25) (1885) found difficulty in isolating the alkaloid from the fluidextract by the addition of ammonium hydroxide due to the accompanying brown flocculent precipitate. This precipitate was first removed by filtering through a pledget of cotton.

Rusting (26) (1899) concentrated the fluidextract mixed with water to certain weight and filtered the mixture through talc or infusorial earth. Tragacanth was used to facilitate the separation of the ethereal layer, and petroleum ether to remove the canadine.

Eldred and Pence (27) (1908) offer a comparison of four methods with the U. S. P. method. Puckner (28) (1908) just prior to this, called to the attention an error introduced by the 1900 U. S. P. assay. The error attributed to the berberine hydriodide precipitate carrying down the Hydrastine, hence 50 cc. taken for examination did not fully represent 5 cc. of the fluidextract.

The following tables give the comparative results:

1. Puckner Method.—Similar except that the fourth alkaline ether extraction was made and weighed separately. Results are given per 100 cc. of fluidextract:

Three extractions	1.96 Gm.	1.968 Gm.
Fourth extraction	0.044 Gm.	0.042 Gm.
Total	2.004 Gm.	2.010 Gm.

The alkaloidal residue softens at 110° C. and melts at 127° C. Results show that iodine precipitation retains Hydrastine when washed according to Puckner Method.

2. Ether Extraction Method.—Five cc. of the fluidextract placed in a separator with 10 cc. of 2% sulphuric acid and 30 cc. of water. The alkaloid extracted with ether after alkalinization.

Three extractions	2.15 Gm.	2.174 Gm. per 100 cc.
Fourth extraction	0.027 Gm.	0.018 Gm. per 100 cc.
Total	2.177 Gm.	2.192 Gm. per 100 cc.

The alkaloidal residue softens at 111° C. and melts at 130° C.

3. U. S. P. Method.

Three extractions	1.902 Gm.	1.892 Gm.
Fourth extraction	0.03 Gm.	0.046 Gm.
Total	1.932 Gm.	1.938 Gm.

The residue softens at 118° C. and melts at 128° C.

4. U. S. P. Method, acidulated with sulphuric acid and washed four times with ether, then made alkaline and extracted with four portions of ether.

Hydrastine	1.776 Gm.	2.756 Gm.

The alkaloid melts at 130° C. without previous softening. Non-alcoholic fluidextract of Hydrastis was assayed by method "2" before adding glycerin, then adjusted to 1.25 Gm. per 100 cc. by the addition of glycerin. This gave 1.244 Gm. per 100 cc. Same preparation by Puckner process gave 1.186 Gm., indicating the presence of glycerin.

These experiments eliminated the aliquot part method and indicated that the high temperature at which the residue is dried practically removed the glycerin.

Jones (29) (1915) made a comparative assay of Hydrastis and its fluidextract according to U. S. P. methods.

Process.	Drug assayed by U. S. P. VIII.	Fluidextract assayed by U. S. P. VIII.	Fluidextract assayed by U. S. P. IX.
1. U. S. P. VIII	4.15	3.52	4.22
			4.2
2. U. S. P. VIII	3.12	2.56	3.14
3. U. S. P. plus 20% glycerin	3.83	2.61	3.21
			3.26
4. Purchased product		2.00	2.26

Products 1 and 2 are made strictly according to the U. S. P. VIII formula. Product 3 is made by the same process except that it contains 20% of glycerin instead of the official 10%. From the above data, the results obtained are higher in the U. S. P. IX assay than in the U. S. P. VIII method as compared to the drug. In Process 3, 10% glycerin proved more efficient in the extraction than the 20%. The high results of U. S. P. IX is not incorrect. The amount of ether used in maceration is too small to prevent a crystallization of Hydrastine. This was corroborated by Dichgan (*Apoth. Ztg.*, 45 (1914), 498–450), who used two and a half times as much ether in proportion by the Swiss method.

The Proposed Dutch assay (30) (1925) is a gravimetric process. Tragacanth is used to aid the separation of the ethereal layer and petroleum ether to remove the alkaloid, canadine. By this procedure 0.040 Gm. of Hydrastine should be isolated from 3 Gm. of the rhizome and 0.039–0.041 Gm. from 55 cc. of the fluidextract.

REFERENCES.

(1) U. S. P., 1900.
(2) *Ibid.*, 1910.
(3) *Ibid.*, 1920.
(4) Proc. A. Ph. A., 42 (1894), 188.
(5) *A. J. P.*, 34 (1862), 141.
(6) *Ibid.*, 50 (1878), 470.
(7) *Ibid.*, 66 (1894), 201.
(8) Proc. A. Ph. A., 37 (1889), 709.
(9) *Ibid.*, 41 (1899), 257.
(10) "Yearbook, British" (1894), 136.
(11) *A. J. P.*, 73 (1901), 211.
(12) *Ibid.*, 71 (1899), 257.
(13) Proc. A. Ph. A., 50 (1902), 854.
(14) *Am. Druggist*, 49 (1906), 361.
(15) A. B. Lyons, "Chemical Assay of Organics and Galenicals" (1920), 149.
(16) Year Book, A. Ph. A., 7 (1918), 257.
(17) *Ibid.*, 9 (1920), 620.
(18) "Yearbook, British" (1903), 91.
(19) *Ibid.*, (1916), 15; also 4 (1915), 125.
(20) Year Book, A. Ph. A. 9 (1920), 289.
(21) "Yearbook, British" (1921), 247.
(22) *Ibid.* (1925), 430.
(23) Year Book, A. Ph. A., 8 (1919), 235.
(24) "Yearbook, British" (1916), 15.
(25) *Am. Druggist* (1885), 84.
(26) *A. J. P.*, 71 (1899), 344.
(27) Proc. A. Ph. A., 56 (1908), 836–838.
(28) *Ph. Review*, 26 (1908), 132.
(29) Jour. A. Ph. A., 4 (1915), 106–108.
(30) "Yearbook, British" (1925), 303.

The following table offers a summary of the results obtained by various assayers. The data was obtained through the Digest of Comments and Yearbook:

Ether-Soluble Alkaloids.

Reporters.	No. of samples.*	Minn.	Max.	References.
Roberts, J. H.		2.75		Jour. A. Ph. A., 11 (1922), 636.
Ewe, G.	60	3.29–	4.20	Penn. Ph. Assn., 9 (1920), 310.
Dohme, R. L.	4	2.53	5.5	"Proc. N. W. D. A." (1917), 85.
Sayre, *et al.*	5	2.42	2.99	"Rep. Kans. Bd. Health," 113 (1917), 112 and 263.

* This represents the number of lots assayed.

Reporters.	No. of samples.*	Minn.	Max.	References.
Scoville, W. L.		2.23–	3.7–5.5	Jour. A. Ph. A., 6 (1917), 410.
Anon.	10	2.15	5.59	Proc. A. Ph. A., 5 (1916), 119.
Patch, E. L.	3	3.2	4.2	Jour. A. Ph. A., 5 (1916), 539.
Roberts, J. G.	13	2.51	3.45	"Proc. Pa. Ph. A.," 5 (1916), 113.
Scoville, W. L.	1		2.7	Jour. A. Ph. A., 5 (1916), 539.
Swift, E. G.	6	2.23	5.5	*O. P. D. R.*, No. 10 (1916), 46.
Vanderkleed, C.	5	3.16	5.39	Jour. A. Ph. A., 5 (1916), 539.
Caesar & Loretz	10	2.25	4.21	*Jahres-Bericht* (1907), 50.
Jensen, H. P.	15	2.6	3.6	*Evans Anyl. Notes* (1914), 37.
Linke, H.	3	2.57	3.03	*Apoth. Ztg.*, 29 (1914), 637–639.
Mann, E. W.	9	1.96	3.44	*Ann. Rep.*, Southall Bros., (1914), 15.
Vanderkleed, C.	2	3.22	3.42	Proc. A. Ph. A. (1914), 160.
Dohme & Engelhart			3.0	*O. P. D. R.*, 83 (1913), 55.
Brown, L. A.	5	0.79	2.5	"Proc. Ky. Ph. A." (1913), 55.
Caesar & Loretz	14	2.81	4.64	*Jahres-Bericht* (1913) 107.
Engelhart,	9	1.5	3.5 (8)	Jour. A. Ph. A., 2 (1913), 164.
Gane, E. H.	2	3.13	3.6	*Ibid.*, 2 (1913), 680.
Kebler, L. F.	1		3.01	*Ibid.*, 2 (1913), 1095.
Patch, E. L.	3	1.6	3.44–0.48	Jour. A. Ph. A., 2 (1913), 1095.
Roberts, J. G.	2		2.45	Proc. A. Ph. A. (1913), 96.
Mulford Laboratory	6	2.9	4.09	Jour. A. Ph. A., 2 (1913), 978.
Caesar & Loretz		2.66	3.62	*Jahres-Bericht* (1912), 81.
Gane, E. H.	7	2.72	3.5 (4)	Jour. A. Ph. A., 1 (1912), 500.
Jensen, H. P.	19	2.3	3.5	*Evans Anyl. Notes*, 7 (1912), 38.
Mann, E. W.	3	2.31	2.55	*Ann. Rep.*, Southall Bros. (1912–1913), 13.
North, H.	43	2.55	4.12	*Rep. Lehn & Fink, Analyt. Dept.* (1910–1913), 47.
Patch, E. L.	3	3.02	3.2	Jour. A. Ph. A., 1 (1912), 500.
Scoville, W. L.	34	2.5	3.5	*Ibid.*, 1 (1912), 1341.
Noyes, C. R.	5	2.7	3.0	"Proc. Minn. Ph. A." (1911), 75.
Ferguson, G. A.	12	2.51	3.21	"Proc. N. Y. Ph. A." (1911), 152.
Vanderkleed, C.	11	2.88	4.85	*Ibid.* (1911), 132.
Smith & Cline	3	2.65	3.4	*Analyt. Rep.* (1911), 25.
Evans	10	2.77	3.46	*Ibid.* (1911–1912), 36.
Caesar & Loretz		2.6	4.44	*Jahres-Bericht* (1911), 56–57.
Clark, A. H.	30	2.5	4.5	Bull. A. Ph. A., 5 (1910), 124.
Eldred, Frank,	19	2.8	3.8	Proc. A. Ph. A., 58 (1910), 892.
Gane, E. H.	2	2.7	3.1	*Ibid.*, 58 (1910), 743.
Ladd, E. F.	17	1.7	5.8	*Bull. Agri. Exp. Sta. N. D.*, 1 (1910), 254.
Vanderkleed, C.	12	2.6	5.33	"Proceedings Pa. Ph. A." (1910), 147.
Caesar & Loretz		2.63	4.06	*Jahres-Bericht* (1910), 50.
Gane & Webster	13	2.13	3.33	*Drug Topics*, 23 (1908), 325.
Vanderkleed, C.	8	2.8	4.03	"Proceedings Pa. Ph. A." (1908), 88.
Smith & Kline	3	3.0	4.00	*Analyt. Rep.* (1908), 23.
Roder, P.	5	2.43	2.71	*Jahres-Bericht* (1908), 117.
Carr & Reynolds		1.14	3.17	*London J. Ph.*, 26 (1908), 543.
Caesar & Loretz	9	3.59	4.22	*Geschaft-Bericht* (1908), 51.
Clark, A.	15		2.5	Proc. A. Ph. A., 56 (1908), 836.
Carr & Reynolds		1.14	3.17	*Lon. J. Ph.*, 26 (1908), 543.
Hankey		2.75		"Proc. Pa. Ph. A. (1907), 70.
Vanderkleed, C.	11	2.5	4.4	*Ibid.*, 89.

Reporters.	No. of samples.*	Minn.	Max.	References.
Caesar & Loretz	2	2.68	4.64	*Geschaft-Bericht* (1907), 50.
Roder, P.	11	2.16	2.86	*Jahresb. Wein* (1907), 104.
Roder, P.	15	0.08	3.14	*Pharm. Post.*, 39 (1906), 284.
Smith & Kline	2	2.2	2.85	*Lab. Reports* (1906), 17.
Sayre, L. E.	18	1.55	2.95	Bull. Kans. Bd. Health (1907), 44.
Vanderkleed, C.	7	2.5	3.55 (2)	"Proc. Pa. Ph. A." (1906), 223.
Jones, H. M.	14	2.26	4.22	JOUR. A. PH. A., 4 (1915), 106–108.
Slothmer, G. A.		1.03	1.23	"Pa. Ph. A." (June 21, 1927).
Schmidt, Elsa		1.2	2.69	*A. J. P.*, 71 (1899), 86.

EXPERIMENTAL.

The Hydrastis was obtained from the Skagit Valley Golden Seal Company of Mt. Vernon in the fall of 1927. The farm contains twenty-two acres of Golden Seal, all under artificial slat shade. It is equipped with an efficient irrigation system, also with washing machine and a drying kiln. No restrictions were offered as to the time of collection, quantity, dug, or location of experimental plots. Markers were placed so that the work could be carried on during succeeding years. During the winter, both dried and fresh drug was delivered at the laboratory upon request. An expression of appreciation is hereby implied for the generous cooperation of Mr. J. A. Boyce, president of the Skagit Valley Goldenseal Company.

To further the investigation in Hydrastis and other drug plants, the company has established the Skagit Valley Goldenseal Farm Fellowship, in the University of Washington, College of Pharmacy.[1]

TABLE I.

Stock no.	Yrs. age.	No. of plants.	No. of buds.	Total weight Gm.	Rhizome, Gm.	Root, Gm.	% Wt. rhizome.	% Wt. root.	% Crop compared to No. 3.
7	12	..	..	212	112	100	52.78	47.22	....
3	6	9	76	455	145	310	31.87	68.13	100
4	6	8	74	330	75	255	22.7	77.3	72.5
22	6	..	..	360	100	260	27.8	72.2	....
2	5	12	83	225	65	190	25.5	74.5	56.0
6	4	6	56	132	22	110	16.7	83.3	29.0
1	3	6	54	172	32	140	18.6	81.4	37.8
5	3	5	25	148	33	115	22.3	77.7	32.5

Remarks.—Numbers 3, 4, 2, 6, 1 and 5 were harvested the latter part of September 1927. Four square feet were dug, each from the corner of a bed. Number 7 represents the yield of a circle about 20 inches in diameter; the roots were so intermeshed as to form a solid network about 6 inches thick. Number 5 represented plants propagated from cuttings of 6-year old plants, the age represents the time since the cuttings were planted. This lot was characterized by having root clusters 18 inches long. The samples were washed, air-dried and then placed in the drying kiln having an average temperature of 120° Fahrenheit. Number 22 represents a sample taken from the drying kiln at the Skagit Valley Goldenseal Farm. After the samples were dried a rough count of plants and buds was made, and the sample weighed. The rhizomes and roots were separated by hand, each weighed separately and then ground. All ground samples were preserved in tightly closed glass containers for further investigation.

It is of interest to note that the average ratio of buds to plants is about 9 to 1, No. 5 being the exception. The total weight decreases appreciably with the decrease in years. In

[1] NOTE: A report of the investigation for 1928 and 1929 will be given before the Scientific Section, A. PH. A., at Baltimore, in May 1930.

fact, Nos. 3 and 4 show a decided difference. (Number 22 taken from kiln.) This difference was noticeable even in the farm tract. Number 4 representing a "poor stand" attributed, by the foreman of the farm, to the soil conditions. It may also be assumed, based only on the above table, that the older plants, not only yield a higher total weight, but also a greater percentage yield of rhizome.

NOTE: No definite conclusions may be drawn from only one year's results. This work will be continued with the hope of obtaining information not only of scientific interest but of commercial value also.

This comment applies to all of the experimental data submitted.

TABLE II.

Stock no.	Age.	Alkaloidal Content. Plant.	Rhizome.	Root.	
7	12	3.08	3.44	3.00	
3	6	3.12	3.8	2.8	
4	6	3.00	4.03	2.7	
10	6	2.43			From drying kiln at farm
22	6	2.71	3.1	2.5	From drying kiln at farm
2	5	2.91	3.4	2.77	
6	4	3.00	3.86	2.75	
1	3	3.27	3.30	2.56	
5	3	2.73	3.5	2.6	
8	2	3.00			Regular sowing
9	2	2.20			Thick cluster, spilled seed
12	6				2.30 "nuggets"
13	6			2.70	Rhizomes transplanted, small number
11	6				1.42 fibre from washing
15	6				1.46 fibre from washing (1926 crop)
17	6			1.93	1926 crop, broken off roots
23	2			2.23	Roots cut from plants reset 1927
14					0.88 dried whole leaf from stock
18					2.20 leaf tissue only (see No. 16)
16					0.45 stems only from No. 18
20					1.73 leaf tissue-leaves killed by fungus
19					0.07 stems from No. 20

Remarks.—From the above table it becomes apparent that the total alkaloidal content of the plant does not vary to any great extent irrespective of the age. Numbers 10 and 22 show a lower alkaloidal content than Nos. 3 and 4. All being of the same age. The first two were washed and dried in the farm plant; the second two (3 and 4) in the laboratory. (See Table No. 1—Remarks.) From the information available relative to the process used at the farm, it is assumed that the fault lies in the curing. Experiments are being conducted in an attempt to ascertain this.

As has been reported, the alkaloidal content of the rhizome is greater than that of the roots. The ratio between the two is variable. This difference in alkaloidal content is equalized by the variation in ratio of weight of rhizome to roots.[1] (See Table No. 1.) During the process of washing some of the roots and rootlets are broken off. These are collected, dried and listed as fibre. Numbers 11, 15, 17 represent this by-product. It varies in quality from very fine rootlet to moderately sized root. (No. 17.) Plants taken from the seed bed for resetting, are trimmed before transplating. Number 23 represents these "trimmings." The leaves taken from numbers 1 to 10 were dried in the laboratory, the stems separated from the leaf tissue, by hand, and each assayed separately. Among the leaves were some that were black in color and dry when picked that had been killed by a fungus growth (Nos. 19, 20). Number 14 represents a sample of whole leaf taken from the kiln at the farm. Before harvesting the drug plant, the leaves are removed by pulling. The procedure often removes buds and portions or rhizomes.

[1] NOTE: The results of the 1928 and 1929 investigations seem to indicate that this condition is not constant. The results of these two years do not comply as do the results of 1927.

These "nuggets" are broken off and dried separately. Number 12 represents the dormant leaf bud with a portion of the rhizome (nuggets) obtained from six-year old plants.

The U. S. P. X method of assay was used. The results given being the average of two or more assays. The column indicating the total alkaloidal content is computed, based upon the relative yield weights, and alkaloidal content of the rhizome and roots.

TABLE III.

		% Total Ash.			% Acid. Insoluble Ash.			% Acid-Soluble Ash.		
No.	Age.	Plant.	Rhizome.	Root.	Plant.	Rhizome.	Root.	Plant.	Rhizome.	Root.
7	12	5.41	3.55	7.5	1.46	0.66	2.37	3.95	2.89	3.13
3	6	6.67	3.60	8.12	3.15	0.80	4.24	3.52	2.80	3.88
4	6	7.85	3.2	9.18	3.36	0.76	4.28	4.49	2.44	4.90
13	6			5.09			0.99			4.10
10	6	5.08			2.11			2.97		2.97
22	6	4.60	3.26	5.1	0.583	0.47	0.66	4.017	2.99	4.63
2	5	5.5	3.28	6.35	1.92	0.85	2.33	3.58	2.43	4.02
6	4	5.28	3.03	6.65	1.32	0.15	1.56	3.96	2.88	5.09
1	3	5.85	3.29	6.45	1.49	0.74	1.67	4.36	2.55	4.78
5	3	3.02	2.9	3.06	0.677	0.15	0.83	2.34	2.75	2.23
8	2	5.28			0.54			4.74		
9	2	7.58			2.53			5.05		
12			3.48			0.34			3.14	
15				9.47			2.72			6.75
17				7.03			0.75			6.28
11				12.95			4.63			8.32
		Whole Leaf	Tissue	Stems	Whole Leaf	Tissue	Stems	Whole Leaf	Tissue	Stems
14		6.08			1.06			5.02		
16				8.66			1.22			7.44
18			6.55			2.12			4.43	

Remarks.—Considerable variation exists in the amount of acid-insoluble ash found. This is due to the care exercised in washing the samples. Numbers 10 and 22 were washed and dried at the farm plant. These show evidence of a more careful washing than those washed by hand in the laboratory. Numbers 15, 17 and 11 represent samples of small roots and rootlets broken off during the washing process at the farm plant. They are listed as fibre and considered as a by-product. Number 11 was quite fine and dusty. The results given in the columns "plant" were computed, based upon the relative weights of rhizome and roots and their respective ash contents. (See Table No. 1.) The per cent of acid-soluble ash represents the difference between the total and acid-insoluble ash. The U. S. P. X method for ash determination was used.

TABLE IV.

			Ash.			
No.	Age.	% Alkaloid.	Total.	Ac. ins.	H_2O.	Absolute alkaloid.
7	12	3.08	5.41	1.46	4.47	3.27
3	6	3.12	6.67	3.15	2.954	3.32
4	6	3.00	7.85	3.36	2.68	3.19
10	6	2.43	5.08	2.11	5.0	2.61
22	6	2.71	4.60	0.583	4.28	2.85
2	5	2.91	5.50	1.92	3.0 (Rt)	3.06
6	4	3.00	5.28	1.32	4.0 (Rt)	3.13
1	3	3.27	5.85	1.49	3.0 (Rt)	3.41
5	3	2.73	3.02	0.677	5.0 (Rt)	2.89
8	2	3.00	5.28	0.54	4.07	3.15
9	2	2.20	7.58	2.53	3.47	2.34

Remarks.—Table No. 4 offers a summary of the analysis of the whole drug. The absolute alkaloidal content was computed, and represents the drug with no moisture present and no

acid-insoluble ash. The average for the above is 3.02 per cent; with the plants varying in age from 2 to 12 years. Various deductions may be made. However, this is considered as preliminary work, and the results of future years' investigation are necessary before conclusions may be offered.

APPENDIX.

Attention has been called to the difference in alkaloidal content of several lots taken from the tract containing 6-year old plants. (See Table No. 2—compare Nos. 3 and 4 with Nos. 10 and 22.) On the assumption that, apparent loss of alkaloids in the farm plant cured drug was due to the curing process used, several preliminary, but crude tests were carried out in an attempt to ascertain if exposing the freshly washed drug to a high degree of heat, would affect the alkaloidal content.

Ten-gram samples of the powdered Hydrastis were thoroughly wetted with water. These samples were dried in a hot air oven using different temperatures. The length of time to dry the samples approximated about forty-eight hours.

The samples were assayed according to the U. S. P. X method. The following table represents the results obtained from the experiment:

No.	Part.	Temperature.	% Alkaloid.	% Alkaloid before wetting.	% Loss.
4	Root	120–127° C.	1.495	2.67	43.8
3	Root	120–127° C.	1.70	2.83	39.4
12	Fibre	100° C. 6 hrs. 35° 24 hrs.	2.07	2.35	29.0
4	Root	100° C. 6 hrs. 35° 24 hrs.	2.088	2.67	21.8
5	Root	35° C.	2.35	2.62	10.5
2	Root	35° C.	2.234	2.77	19.3

The results would seem to indicate that the maximum temperature for drying the drug is considerably below 35° C. Material has been obtained for carrying on the investigation on fresh plants.

Hydrastine is hydrolyzed into hydrastinine and opianic acid when high heat is applied, or in the presence of oxidizing agents and water as follows:

$C_{21}H_{21}O_6N + HCH$ → $C_{10}H_{10}O_5 + C_{11}H_{13}O_2N$

Hydrastine — Opianic acid + Hydrastinine

M. W. 383.28 — M. W. 207.112

Complete oxidation of the Hydrastine would yield 54.036 per cent of its weight as hydrastinine.

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THE EFFECT OF CERTAIN HYPOGLYCEMIC DRUGS UPON THE GROWTH OF THE SEEDLINGS OF LUPINUS ALBUS.

BY JOHN C. KRANTZ, JR.

Introduction.—In 1923 Ellis and Eyster (1) studied the effect of insulin and glucokinin upon the growth of maize seedlings. They observed that either of these drugs in concentrations less than 0.005 per cent promoted the growth of these seedlings whereas in concentrations greater than this value a definite retardation of

growth was noticed. In 1924, these same investigators (2) observed that the purification of crude insulin and glucokinin by dialysis left a residue of nondialyzable substances which were the growth-promoting fractions of the crude substances.

It occurred to the author that it would be interesting to test the relative toxicity of commercial insulin of various unitages and compare this with the toxicity of other hypoglycemic drugs by the phytopharmacologic method developed by Macht (3 and 4) and his associates.

EXPERIMENTAL.

Commercial Insulin.—A sample of commercial insulin U-10 was mixed with the nutrient solution (Shive Solution (5)) in which the measured seedlings were planted —the increment of growth was determined after twenty-four hours and compared with the normal growth of the seedlings in Shive Solution. The growth in the nutrient solution is considered one hundred per cent.

Table I shows the results obtained with commercial insulin:

TABLE I.

Conc. insulin.	Percentage growth.
8 U per 100 cc.	79.8
12 U per 100 cc.	74.9
16 U per 100 cc.	64.6
24 U per 100 cc.	64.1

These results indicate that commercial insulin exerts an inhibiting action upon the growth of the seedlings, but that the retardation is not proportional to the concentration of the unitage of insulin. Repeating this experiment several times with various unitages of commercial insulin the author was unable to secure a significant quantitative relationship between the retardation in growth of the seedlings and the concentration of insulin in units.

Crystalline Insulin.—Through the kindness of Dr. E. M. K. Geiling of the Department of Pharmacology of the Johns Hopkins University, the author obtained a sample of Abel's crystalline insulin (6) for investigation.

Table II records the results of the action of Abel's crystalline insulin upon the seedlings:

TABLE II.

Conc. of insulin.*	Percentage growth.
4 U per 100 cc.	83.5%
8 U per 100 cc.	85.0%
16 U per 100 cc.	85.0%
24 U per 100 cc.	77.1%

* One mg. is the equivalent of 40 units.

Again it may be observed that in these concentrations crystalline insulin is toxic to the seedlings of lupinus albus, but the author was unable to obtain significant quantitative data.

Synthalin.—Through the kindness of Dr. Eugene Leopold of the Johns Hopkins Hospital a sample of Frank's Synthalin (7) which is decamethylene diguanidine dihydrochloride or $HCl.NH_2.C:NH.NH.(CH_2)_{10}.NH.C:(NH).NH_2.HCl$. was obtained.

Table III records the results of the action of synthalin upon the seedlings:

TABLE III.

Conc. synthalin.	Percentage growth.
4 mg. per 100 cc.	43.1
8 mg. per 100 cc.	32.5
8 mg. per 100 cc.	33.0
16 mg. per 100 cc.	27.7

In Table III the extreme retarding influence of synthalin upon the growth of the seedlings may be observed. It is interesting in this connection to note that the studies of Staub and King (8) indicate that synthalin is a protoplasmic poison.

Neosynthalin.—Through the kindness of Mr. F. E. Bibbins of Eli Lilly & Company a sample of neosynthalin (9) was obtained. On account of the insolubility of this substance in water an alcoholic solution was employed, using the same concentration of alcohol in the control Shive Solutions. Upon dilution with the nutrient solution the neosynthalin precipitated from its alcoholic solution but remained rather uniformly suspended.

Table IV records the results of the action of neosynthalin upon the seedlings:

TABLE IV.

Conc. neosynthalin.	Percentage growth.
1.7 mg. per 100 cc.	77.5
3 mg. per 100 cc.	71.0

Table IV indicates that neosynthalin retards the growth of the seedlings, but not near so markedly as does synthalin.

Glukhorment.—A German preparation by the name of Glukhorment was studied next. This product is claimed to be valuable when administered by mouth in the treatment of *diabetes mellitus*. The product is said to be a mixture of a pancreatic powder and a phosphoric acid derivative of guanidine (10).

Table V records the results of the action of Glukhorment upon the seedlings:

TABLE V.

Conc. Glukhorment.	Percentage growth.
3.3 mg. per 100 cc.	38.2
8.3 mg. per 100 cc.	23.6
13.2 mg. per 100 cc.	20.0

Like synthalin, Glukhorment was very toxic to the seedlings of lupinus albus.

Myrtillin.—Through the kindness of Dr. F. M. Allen of Morristown, N. J., a sample of myrtillin (11) was obtained for study.

Table VI records the results of the action of myrtillin upon the seedlings:

TABLE VI.

Conc. myrtillin.	Percentage growth.
34 mg. per 100 cc.	74.8
100 mg. per 100 cc.	40.2
170 mg. per 100 cc.	26.1

In smaller concentrations myrtillin was practically non-toxic to the seedlings, in fact in very high dilution the presence of this substance in the nutrient solution could not be detected on account of its apparently not influencing the increment of growth.

In order to obtain the relative degree of toxicity of these drugs upon the

seedlings several series were grown simultaneously containing insulin, Abel's insulin, synthalin, Glukhorment and myrtillin, respectively.

Table VII records the results of this comparative study:

TABLE VII.

Substance.	Concentration.	Percentage growth.
Insulin	8.5 U per 100 cc.	64.9
	17 U per 100 cc.	58.5
Abel's Crystalline Insulin	0.3 mg. per 100 cc.	87.0
Synthalin	0.3 mg. per 100 cc.	76.8
Glukhorment	0.3 mg. per 100 cc.	78.5
Myrtillin	0.3 mg. per 100 cc.	93.5

In the concentrations employed myrtillin is the least toxic to the seedlings, whereas the guanidine compounds are exceedingly toxic. The commercial insulin 8.5 U per 100 cc. contained (on the basis of Abel's crystalline insulin) approximately 0.2 mg. This would seem to indicate that the extractive material in the insulin preparation, other than insulin, was quite toxic to the seedlings.

CONCLUSIONS.

1. The action of certain hypoglycemic drugs upon the seedlings of lupinus albus has been studied.

2. Certain comparisons of toxicity of these drugs to plant protoplasm have been pointed out.

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PHARMACEUTICAL RESEARCH LABORATORY,
SHARP & DOHME.

AMINO ALCOHOLS IV.

POTENIOMETRIC MEASUREMENTS OF CERTAIN HOMOLOGUES OF EPHEDRINE.

BY JOHN C. KRANTZ, JR., AND WALTER H. HARTUNG.

INTRODUCTION.

Since the introduction of ephedrine into the practice of medicine by Chen and his associates (1 and 2) and the synthesis of this alkaloid by Fourneau and Kanao (3) many of its homologues and analogues have been studied chemically, pharmacologically and clinically. (Adams, *et al.* (4) and others have prepared several of the homologues of ephedrine and studied their action upon blood-sugar

and also their pressor activity.) Miller and Piness (5) have studied phenylethanolamine clinically, and recommended it as a substitute for ephedrine.

One of us (W. H.) (6) has prepared several of the homologues of ephedrine in these laboratories and some of these exhibit definite pharmacological reactions. The availability of this series of homologous amino alcohols offered itself as an opportunity to compare the dissociation constants of these bases, and to initiate a study of physical characteristics as related to pharmacological behavior.

EXPERIMENTAL.

The hydrochlorides of several of the amino alcohols were prepared and purified as described elsewhere. Tenth molar solutions of these compounds were prepared and their hydrogen-ion concentrations determined by the Wilson (7) hydrogen electrode.

Table I records the results of these determinations.

TABLE I.

Amino alcohol salt.	$[H^+]$ in 0.1 *M.* sol.	P_H in 0.1 *M.* sol.
Phenylethanolamine hydrochloride	1.03×10^{-4}	3.99
Phenylpropanolamine hydrochloride	2.51×10^{-5}	4.60
Phenylbutanolamine hydrochloride	2.56×10^{-5}	4.59
Phenylpentanolamine hydrochloride	2.95×10^{-5}	4.53
Diphenylethanolamine hydrochloride	1.34×10^{-4}	3.87
p-Tolylpropanolamine hydrochloride	2.68×10^{-5}	4.57
p-Tolylbutanolamine hydrochloride	2.26×10^{-5}	4.64
p-Hydroxylphenylpropanolamine hydrochloride	2.04×10^{-5}	4.69
Phenylpropanolmethylamine hydrochloride	7.76×10^{-6}	5.11

From these data the degree of hydrolysis of the hydrochlorides of the amino alcohols were calculated by the following formula.

$$\frac{[H^+] \times 100}{A \times C} = \text{per cent hydrolysis.}$$

A = the degree of ionization of the strong acid in 0.1 *M.* solution or 0.92.
C = the molar concentration of the salt.

These data are recorded in Table II.

TABLE II.

Amino alcohol salt.	Percentage hydrolyzed in 0.1 *M.* sol.
Phenylethanolamine hydrochloride	11.2×10^{-2}
Phenylpropanolamine hydrochloride	2.72×10^{-2}
Phenylbutanolamine hydrochloride	2.78×10^{-2}
Phenylpentanolamine hydrochloride	3.20×10^{-2}
Diphenylethanolamine hydrochloride	14.5×10^{-2}
p-Tolylpropanolamine hydrochloride	2.91×10^{-2}
p-Tolylbutanolamine hydrochloride	2.45×10^{-2}
p-Hydroxylphenylpropanolamine hydrochloride	2.21×10^{-2}
Phenylpropanolmethylamine hydrochloride	8.43×10^{-3}

Some of the free base phenylpropanolamine and also phenylpropanolmethylamine, or ephedrine base, were prepared and dissolved in water preparing 0.1 *M.* solutions, respectively.

The hydrogen-ion concentrations of these solutions were measured.

1. Phenylpropanolamine—0.1 *M.* solution p_H 10.32
2. Phenylpropanolmethylamine—0.1 *M.* solution p_H 10.76

From the hydrogen-ion concentrations of the hydrochlorides of these bases in 0.1 *M.* solution the dissociation constants of the bases were calculated. The following formula (8) was employed.

$$K_b = \frac{[C] \times K_w}{[H^+]^2}$$

The hydrogen-ion concentration of phenylpropanolamine hydrochloride in 0.1 *M.* solution is 2.51×10^{-5} and $K_b = 1.6 \times 10^{-6}$. The hydrogen-ion concentration of phenylpropanolmethylamine hydrochloride in 0.1 *M.* solution is 7.76×10^{-6} and $K_b = 1.7 \times 10^{-5}$. By colorimetric methods Abildgaard and Rasmussen (9) found the dissociation constant for this compound (*l*-ephedrine) to be 2.3×10^{-5}.

CONCLUSIONS.

1. The hydrogen-ion concentration of the hydrochlorides of certain homologues of ephedrine has been determined.

2. The degrees of hydrolysis have been calculated.

3. The hydrochlorides of phenylethanolamine and diphenylethanolamine exhibit a higher hydrogen-ion concentration than the hydrochlorides of those amines having a greater number of carbon atoms in the side chain.

4. No marked relationship between the physical measurements determined and the pharmacological behavior was observed.

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RESEARCH LABORATORIES,
SHARP AND DOHME.

The Seventy-Ninth Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Miami, Florida, in 1931. The 1932 Meeting (the 80th) will be held in Canada, jointly with the Canadian Pharmaceutical Association.

STUDIES ON THE ANALYSIS AND CHEMISTRY OF NEOARSPHENAMINE II. STUDIES ON THE CHEMISTRY OF SODIUM FORMALDEHYDESULPHOXYLATE AND THEIR RELATION TO THE STRUCTURE OF NEOARSPHENAMINE.*

BY ALFRED E. JURIST AND WALTER G. CHRISTIANSEN.

Up to the present time little has been known of the structure of neoarsphenamine other than to assume that it represents a condensation product of one or two molecules of sodium formaldehydesulphoxylate and one molecule of arsphenamine base. Previous results (1) have shown that two distinct types of "sulphoxylate" derivative might be formed in this reaction, namely, the *N* methylene substitution product and the double salt form. It is the former type with which this discussion is concerned, and in order to obtain some information regarding the nature of the linkage between the amino group of the arsphenamine nucleus and the sodium formaldehydesulphoxylate, it was necessary to obtain information concerning the structure of sodium formaldehydesulphoxylate. A number of investigators have found that neoarsphenamine is unstable in strong acid; "neoarsphenamine acid" precipitates and undergoes a decomposition whereby sulphoxylate is lost. Furthermore, the liberated sulphoxylate is decomposed simultaneously. Consequently it seemed desirable to investigate the effect of strong acid and strong alkali on sodium formaldehydesulphoxylate with the hope that evidence might be obtained bearing on its structure.

EXPERIMENTAL.

Solutions of purified sodium formaldehydesulphoxylate in oxygen-free water were maintained at 25° C. under an atmosphere of nitrogen and treated with sodium hydroxide in one case and hydrochloric acid in another. In each instance the effects of two concentrations of the reagent were studied. Aliquot portions were withdrawn from time to time and analyzed for reducing power with one-tenth normal iodine and for free alkalinity or acidity, as the case might be, using phenolphthalein as an indicator. In all experiments the solutions were neutralized to phenolphtha-

TABLE I.—EFFECT OF SODIUM HYDROXIDE ON SODIUM FORMALDEHYDESULPHOXYLATE AT 25° C.

Concentrations of alkali in moles per mole sulphoxylate.	Time in hours.	Sodium formaldehydesulphoxylate lost in %.	Sodium hydroxide used up in cc. *N*/10.
0.524	0	0.00	0.00
0.524	1/2	0.24	0.10
0.524	1	0.32	0.03
0.524	1 1/2	1.04	0.09
0.524	2	0.89	0.15
0.524	18	2.86	0.46
1.298	0	0.00	0.00
1.298	1/2	0.81	0.34
1.298	1	0.00	0.35
1.298	1 1/2	2.80	0.34
1.298	2	0.99	0.36
1.298	18	2.74	0.46

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

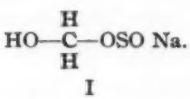
lein before determining the reducing power. The results of these experiments are recorded in Table I and II.

TABLE II.—EFFECT OF HYDROCHLORIC ACID ON SODIUM FORMALDEHYDESULPHOXYLATE AT 25° C.

Concentration of acid in moles per mole sulphoxylate.	Time in hours.	Sodium formaldehydesulphoxylate lost in %.	Hydrochloric acid used up in cc. $N/10$.
0.406	0	0.00	0.00
0.406	1/2	8.95	0.12
0.406	1	10.40	0.08
0.406	1 1/2	14.78	1.23
0.406	2	20.48	1.80
0.406	18	75.20	3.36
1.014	0	0.00	0.00
1.014	1/2	5.26	0.00
1.014	1	6.47	0.33
1.014	1 1/2	9.13	0.00
1.014	2	12.12	0.37
1.014	18	68.72	1.90

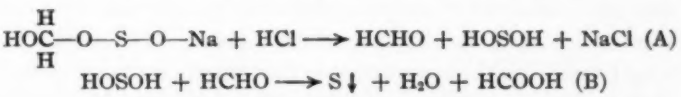
The results given in Table I show that in alkaline solution sodium formaldehydesulphoxylate is quite stable; only a small quantity of the alkali originally present is neutralized by acid liberated by the sulphoxylate. Furthermore, the loss in reducing power is small and compares favorably with the loss in neutral solution; at the end of 18 hours only 2.86% of the original reducing power has been lost. It is also noteworthy that in spite of an increase of 150% in the amount of alkali present in the second set of experiments, the loss of sulphoxylate and the liberation of acid is the same as in the first instance. On the other hand, the loss of reducing power in acid solution is very strikingly shown in Table II; it increases with time and reaches 75.20% in one case and 68.72% in the other at the end of 18 hours. Also, the neutralization of the added acid by the sulphoxylate decomposition products is greater than the neutralization of alkali in the case of the alkali decomposition. However, the liberation of alkali in the acidified solutions is small as compared to the decomposition of the sulphoxylate as measured by the loss in reducing power.

The commonly accepted structure of sodium formaldehydesulphoxylate is given by Jellinck (2) as:

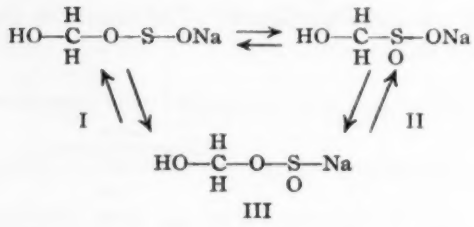


I

This is not the only structure which can be assigned to this substance, because the major decomposition products in acid solution are hydrogen sulphide, formic acid, and sulphur (3). Structure I permits only two decomposition products, namely, sulphur and formic acid according to the following reactions.

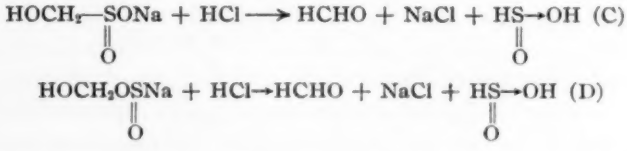


These equations do not allow for the formation of hydrogen sulphide, and in order to account for this it is necessary to assume a tautomerism of the following type.

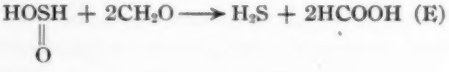


III

The tautomeric form III is similar to that suggested by Orlov (4) for sodium sulphoxylate, but it could not be distinguished from tautomer II by acid hydrolysis because both would yield the same products according to the following equations.



Subsequent reduction of free sulphoxylic acid of this structure by formaldehyde readily accounts for the formation of hydrogen sulphide by the following equation.

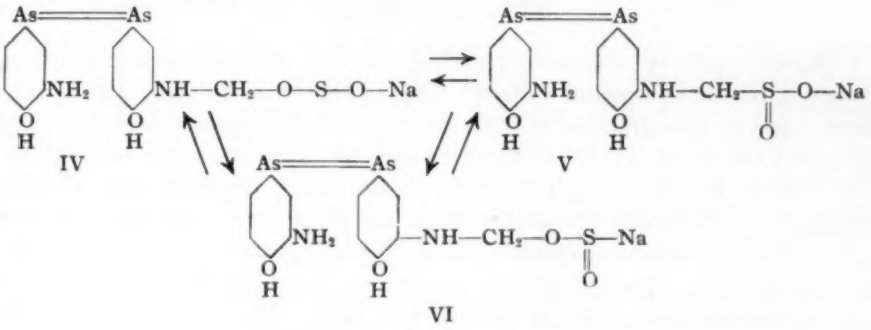


Hydrogen sulphide cannot be accounted for otherwise, because free sulphur cannot be considered as intermediate in the formation of hydrogen sulphide; it would be precipitated before it could be further reduced. Also, under the anærobic conditions used sulphur cannot be formed by oxidation of hydrogen sulphide. Inasmuch as the hydrolysis of sodium formaldehydesulphoxylate is rapid as compared with the reduction (E), an excess of formaldehyde is constantly being supplied to meet the requirements of the reduction reaction.

On the basis of these considerations at least two, and possibly three forms of sodium formaldehydesulphoxylate appear to be necessary to account for the decomposition products. The conclusions as regards the structures of sulphoxylic acid and its salts are the opposite of those of Orlov (4) since he believes that the free acid has the structure, HOSOH, and that the monosodium salt has the structure HOSONa; the formation of hydrogen sulphide in acid solution necessitates the

existence of the form Orlov assigns to the sodium salt in acid solution. Consequently formaldehydesulphoxylic acid and sulphoxylic acid may exist in three forms corresponding to the sodium salts I, II and III. However, the existence of the tautomer III is unlikely except in very small percentages, because aqueous solutions of sodium formaldehydesulphoxylate are weakly alkaline and type III, the salt of a weak acid and a strong base, should give definitely alkaline solutions. This leaves types I and II as the two probable tautomeric forms of sodium formaldehydesulphoxylate. These conclusions are in agreement with those of Raschig (5), and Newberry and Phillips (6) who have pointed out the possible tautomeric nature of formaldehydesulphoxylates and formaldehydebisulphites.

If these conclusions are now extended to neoarsphenamine we find three possible structures for the monosubstitution product.



Of these three formulas number IV is the one usually used. However, number V, it is believed, represents a more stable structure, because the chain N—C—S should represent a more stable structure than the chain N—C—O—S. Number VI represents a type similar to that of sodium formaldehydesulphoxylate III, and since neoarsphenamine solutions are only weakly alkaline, it is thought that form VI is only present in very small amounts; type VI should be similar to III in liberating sodium ions. On the other hand the existence of the other two forms of neoarsphenamine is strongly indicated by analogy to the results obtained from the study of sodium formaldehydesulphoxylate.

On the basis of the facts presented here the existence of at least two tautomeric forms of neoarsphenamine of the types described, numbers IV and V, is strongly indicated since sodium formaldehydesulphoxylate must exist in at least two tautomeric forms to account for the decomposition products obtained in acid solution. It is possible that one of these types is present in greater amount than the others in alkaline solution and vice versa in acid solution but no evidence on this point is available.

SUMMARY.

1. Some information concerning the effect of strong acid and strong alkali on sodium formaldehydesulphoxylate is given and the results obtained are used to demonstrate the probable existence of at least two tautomeric forms.

2. The existence of two or three tautomeric forms of sodium formaldehydesulphoxylate indicates the existence of a corresponding number of tautomeric forms of neoarsphenamine.

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RESEARCH DEPT. OF THE CHEMICAL & PHARMACEUTICAL LABORATORIES,
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AN EMPIRIC ASSAY FOR THE RESIN CONTENT OF COMPOUND PILLS OF MERCUROUS CHLORIDE.*

BY L. E. WARREN.[1]

Compound pills of mercurous chloride, U. S. P. X have essentially the same composition as the compound cathartic pills of the U. S. P. IX. The difference between the two preparations is that the U. S. P. X formula contains resin of ipomea and the U. S. P. IX resin of scammony. Ipomea and scammony are closely related botanically. Their respective resins, although not chemically identical, have practically the same therapeutic properties. The preparation is a complex mixture containing calomel, resin of jalap, gamboge and compound extract of colocynth. The last-named preparation contains aloes, extract of colocynth, cardamom seed, resin of ipomea and soap. The Pharmacopœia directs the use of diluted alcohol as an excipient in compounding pills but most manufacturers use water instead. Also they frequently employ powdered licorice root or powdered extract of licorice as a binder or mass-maker.

Examination of the literature and consultation with manufacturers revealed no method for the assay of compound cathartic pills, except that some attempts had been made to determine calomel. It occurred to the writer, that since nearly all of the ingredients contained resinous material or vegetable acids, a method which would evaluate these constituents taken as a whole would be of empiric value and might serve for the detection of gross adulteration. The method which seemed to offer the greatest possibilities was a modification of the Jenkins' method for the assay of podophyllum.[2] Accordingly this method was tried. As used the method is as follows:

Weigh 20 pills individually and calculate the average weight and the maximum deviations from the average. Pulverize the pills in a mortar and pass the powder through a No. 40 sieve. Mix the pulverized material well.

ALCOHOL SOLUBLE.

Weigh a quantity of the powdered material, equivalent to ten pills, into a Gooch crucible or fat-free thimble. Place the container in a Wiley or a Bailey extractor and extract with alcohol until the material is completely exhausted of alcohol-soluble material. Transfer the alcoholic solution to a 100-cc. graduated flask, cool the solution to room temperature and make up to the mark with alcohol. Mix the solution well. Evaporate 10 cc. of the solution, equivalent to one pill, to dryness on the steam-bath in a weighed beaker and dry the residue at 100° C. for 30 minutes.

TOTAL RESINS.

Measure 10 cc. of the tincture of the material prepared as above described into a separator and add 10 cc. of chloroform and 10 cc. of 0.6 per cent hydrochloric acid (2 cc. of hydrochloric acid in 100 cc. of water). Shake the mixture and allow it to separate. Draw off the lower layer into another separator and repeat the extraction of the liquid in the first separator three times, using 15 cc. of a mixture of one volume of alcohol and two volumes of chloroform, each time, and adding these extractions to the extract in the second separator. Shake the combined extract with 10 cc. of 0.6 per cent hydrochloric acid and allow the mixture to separate. Draw off the lower layer, through a pledget of cotton placed in the stem of the separator, into a weighed flask

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* Scientific Section, A. PH. A., Rapid City meeting, 1929. No discussion.

[1] Food, Drug & Insecticide Administration, Washington, D. C.

[2] *Ind. & Eng. Chem.*, 6 (1914), 671.

and repeat the extraction of the acid liquid three times, using 15 cc. of fresh alcohol-chloroform mixture each time and passing the chloroform layer through the cotton. Evaporate the combined chloroform extracts to dryness, taking care to hold the container in an inclined position as the last portions of solvent are dissipated. Dry the residue to constant weight at 100° C.

Several commercial brands of compound cathartic pills were subjected to these tests. Such uniform results were obtained that it was deemed worth while to apply the method to a number of specimens. Consequently a specimen of the product was obtained from each of ten manufacturers. In addition, a laboratory specimen of unknown age and manufacture was included. Each product was assayed by the method heretofore described. The results obtained are given in Table I.

TABLE I.—RESIN CONTENT OF SEVERAL BRANDS OF COMPOUND CATHARTIC PILLS.

Specimen	Alcohol-Soluble.		Total Resins.			
	Solids.	Per cent.	Per cent.		Grains per pill.	
A	31.63	31.66	19.79	20.03	1.14	1.16
B	38.12	37.88	22.45	22.17	1.11	1.10
C	44.58	44.55	25.60	25.21	1.23	1.21
D	46.82	46.92	24.38	23.73	1.10	1.07
E	50.25	50.29	26.53	26.53	1.17	1.17
F	45.42	45.59	27.57	27.21	1.26	1.25
G	48.93	49.09	18.71	18.74	1.08	1.08
H	40.98	40.97	22.98	22.94	1.15	1.15
I	39.73	39.77	25.42	26.09	1.17	1.19
			25.19	25.67	1.17	1.13
J	51.54	51.13	18.07	18.01	1.05	1.02
K	46.96	47.05	37.57	38.00	1.34	1.35

Origin unknown

If the results from the specimen of unknown origin be excluded, the alcohol-soluble material ranged from about 32 per cent to 51.5 per cent and the total resins from about 18 per cent to 27.5 per cent. The total resins in each pill ranged from 0.066 Gm. to 0.080 Gm. equivalent to from 1.05 grain to 1.26 grain. The average weight of the several brands of pills varies greatly, probably owing to the fact that each manufacturer uses different quantities of excipient or a different excipient. Therefore the determination of the alcohol-soluble matter is not of much value to regulatory officials. In like manner the *percentage* of total resins is not a standard of importance. However, these factors should be valuable checks in the control of manufacturing processes in which the weight and nature of the excipients are known. The criterion of greatest value is the quantity of resins per pill.

In order to secure a preparation of undoubted authenticity the writer visited the laboratory of a pharmaceutical manufacturer and watched the preparation of a batch of compound cathartic pills. A sample of each constituent was taken and the weight of each ingredient was checked before the material was placed in the mixer. The formula used did not contain compound extract of colocynth but instead the several ingredients were added separately in the calculated amounts. Also powdered glycyrrhiza and water were used as excipients instead of diluted alcohol. A sample of the pill mass and a specimen of the uncoated pills as they come from the pill-making machine were also taken. Later a specimen of the coated pill was obtained. Each of these was subjected to the Jenkins' test. The

results are recorded in Table II. It might be expected that there would be slight differences between the results from the uncoated and from the coated pills owing to the fact that the uncoated pills are subjected to a certain amount of drying in starch powder before the coating is put on. However, the coating added tends to make up in weight for the loss in drying.

TABLE II.—COMPARISON OF PILL MASS, UNCOATED PILLS AND COATED PILLS.

Specimen.	Alcohol-Soluble. Solids.	Alcohol-Soluble. Per cent.	Total Resins. Per cent.	Total Resins. Per cent.	Grains per pill.	Grains per pill.
Pill mass	40.2	40.7	27.6	28.5	..	..
Uncoated pill	34.12	34.47	24.42	24.80	1.19	1.21
Coated pill	33.52	33.25	24.68	25.14	1.23	1.26

It will be noted that the quantity of resins in the finished pill is approximately the same as the maximum values found for the ten commercial specimens as recorded in Table I.

Each constituent of the pill mass (except the calomel and water) was then subjected to the Jenkins' assay process in order to determine what proportion of resin or vegetable acid it contributed to the whole. The findings are given in Table III.

TABLE III —CONTRIBUTION (IN RESIN OR VEGETABLE ACID) OF EACH CONSTITUENT TO COMPOUND CATHARTIC PILL MASS.

Constituent.	Per cent of resin (or vegetable acid) by Jenkins' assay.		Per cent of constituent in pill mass.	Per cent resin (or vegetable acid) contributed.
Extract of colocynth	36.3	35.6	4.00	1.44
Aloe	42.50	44.3	12.50	5.42
Cardamom Seed	5.9	5.9	1.25	0.74
Resin of Ipomea	90.1	90.0	3.50	2.25
Soap	79.8	80.0	3.75	3.00
Resin of Jalap	95.3	95.2	6.84	6.52
Gamboge	79.8	79.0	5.00	3.97
Glycyrrhiza	13.50	13.63	31.25	4.28

Some manufacturers object to this general, empiric method on the ground that the normal variations in resin (and vegetable acid) content of the constituent drugs is so great that no dependence should be placed on any standards that might be suggested for the compound preparation. It is true that this objection has a certain degree of validity but, in the absence of any other method whatever for the assay of the resin content of the pills, it would seem that any method which would yield an approximate evaluation of the active constituents of the preparations (other than calomel) would be welcome. Other manufacturers considered the proposed method useful in absence of any other. This principle has been applied by Cocking[1] to the assay of compound tincture of benzoin B. P. . He determines the acid number, ester number, saponification value, etc., of that preparation and, from the data so obtained, makes comparisons with the values obtained from known preparations.

SUMMARY.

A method has been devised for determining the total resins (including some vegetable acids) of Compound Cathartic pills. Ten commercial brands of the product and a specimen of authenticated origin were subjected to the test. The

[1] *Quar. Jour. Pharm.*, 1 (1928), 337.

resin content varied from 0.0660 Gm. to 0.0821 Gm. per pill, equivalent to from 1.05 to 1.26 grain per pill. The method should prove useful to control chemists.

ACKNOWLEDGMENTS.

My thanks are due to a number of pharmaceutical manufacturers for contributing material for this study. I am particularly indebted to Sharp & Dohme for their courtesy in freely opening their manufacturing laboratories for observation and for the generous coöperative spirit of their staff. Thanks are also due to William R. Carter for carrying out a number of the routine determinations.

ASSAY OF OINTMENT OF YELLOW MERCURIC OXIDE.*

BY L. W. GREEN AND R. E. SCHOETZOW.

Notwithstanding the simple nature of this and similar preparations, their assay has offered difficulties. The following general methods were tried but yielded poor checks and low results.

(*a*) Removal of fats by various solvents and weighing the residual mercury oxide.
(*b*) Reduction to metallic mercury, separation and weighing of the same.
(*c*) Digestion with dilute nitric acid, filtration and titration with potassium sulphocyanate solution.

In the first case the difficulties were due to the fine state of subdivision of the mercury oxide which made quantitative filtration impossible. This verifies an observation made by Noel L. Allport (*Quarterly Journal of Pharmacy*, Vol. 1, No. 1, under date of Feb. 4, 1928).

Allport has devised a method in which the ointment is dissolved in a mixed solvent containing 13 parts of benzene, 2 parts of glacial acetic acid and 5 parts of 90% alcohol, and the mercury precipitated and weighed as mercuric sulphide. Sjöstrom (*Pharmazeutische Zeitung* (1915), 554) has given a method in which the ointment is dissolved in ether, the solution mixed with potassium iodide solution and a measured excess of tenth-normal hydrochloric acid added. This method depends upon the reaction $3KI + HgO + H_2O = KHgI_3 + 2KOH$. The excess hydrochloric acid is titrated with tenth-normal potassium hydroxide using phenolphthalein.

We have tried these methods on known ointments with the following results:

Ointment.	Method.	Per cent HgO.
No. 1	Sjöstrom	(*a*) 2.04% (*b*) 1.97%
No. 2	Allport	(*a*) 1.99% (*b*) 2.00%
	Sjöstrom	2.01%
No. 3	Allport	2.13%
	Sjöstrom	2.10%

Both methods have been found satisfactory. The Sjöstrom method is the easier and more rapid to perform.

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* Scientific Section, A. PH. A., Rapid City meeting, 1929.

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Jour. A. Ph. A., 19 (1930), 361
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J. Am. Chem. Soc., 52 (1930), 1349
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Pines, Charles C.
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Heats of formation of the alcoholates of chloral
Jour. A. Ph. A., 19 (1930), 320
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Pharm. Zentralh., 71 (1930), 179
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Palme, Herman
Titration of veronal sodium and veronal
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Purification and testing of the paraldehyde of the German Pharmacopœia
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Volwiler, E. H., and Tabern, D. L.
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J. Am. Chem. Soc., 52 (1930), 1676

Dr. J. J. Durett, whose resignation as chief of the Federal Drug Control work, F. D. I. Administration, was announced last month, will continue in office; he has resumed his duties.

A NEW EXPLANATION OF AN OLD INCOMPATIBILITY.*

BY CHARLES W. BAUER.

We are all acquainted with the effervescence of carbon dioxide in preparing Compound Solution of Sodium Borate and again in making **Alkaline Aromatic Solution.** In searching for a chemical explanation of this phenomena we are unable to find any definite information other than a suggestion made by Scoville in his "Art of Compounding."[1]

Scoville gives the equation advanced by Wm. Duncan but says it is hardly in accord with chemical principles. These equations suggest that glycerin reacts with borax to give boric acid and then boric acid reacts with glycerin to give a glyceryl boric acid which acts upon the carbonate. In the experimental work which follows it shows that a glyceryl boric acid is formed, but of a different formula than the one suggested by Duncan.

Before taking up the experimental work of this paper it may be advisable to consider the assay of boric acid given in the U. S. Pharmacopœia. In this assay glycerin is used. The purpose of the glycerin is expressed by Schimpf in his "Volumetric Analysis,"[2] as developing the acidity of the boric acid in regards to phenolphthalein to a great degree.

To say that glycerin brings out the acidity of boric acid is not a chemical explanation and glycerin is entirely ignored in the equation which represents this reaction. Attention is called to the large quantity of glycerin which is necessary in order for boric acid to show a hydrogen equivalent of one. Also that boric acid and sodium hydroxide in the absence of glycerin give an unsatisfactory end-point with phenolphthalein.

This information leads us to believe that boric acid evidently reacts with glycerin in some way to produce an acid which has a hydrogen equivalent of one. And that this acid in turn reacts with the sodium hydroxide.

A number of experiments were made and it was found that it required at least 3 parts by weight of glycerin to one part by weight of boric acid to give an acid which showed a hydrogen equivalent of one. Since glycerin has a molecular weight of about 92 and boric acid has a molecular weight of about 62, it shows that it takes two molecules of glycerin to react with one molecule of boric acid. This may be shown in the following way:

1	:	3	::	62	:	X
Part by weight of boric acid		Part by weight of glycerin		M. W. of boric acid		Wt. of glycerine

$$X = 186$$

$$186 : 92 = 2$$

∴ Two M. W. of glycerin are required for one M. W. of boric acid.

Therefore for every molecular weight of boric acid it requires two molecular weights of glycerin or for every molecule of boric acid it takes two molecules of glycerin.

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* Section on Practical Pharmacy and Dispensing, A. Ph. A., Rapid City meeting, 1929.

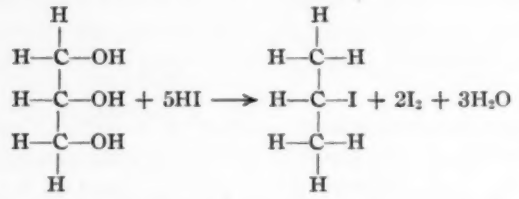
[1] Wilbur L. Scoville, "The Art of Compounding," page 327.

[2] Henry W. Schimpf, "Essentials of Volumetric Analysis," page 108.

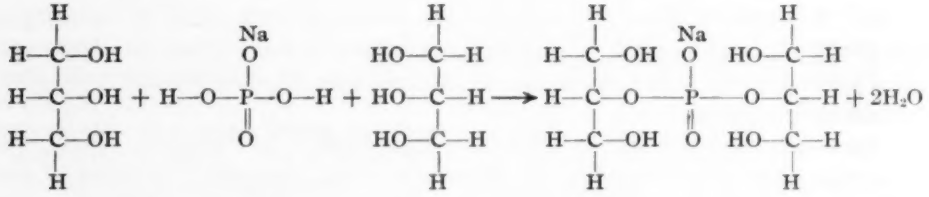
Before attempting to balance an equation between two molecules of glycerin and one molecule of boric acid which will give an acid that has only one replaceable hydrogen let us consider a few of the outstanding chemical properties of glycerin.

In studying the chemistry of glycerin we find that it is a trihydric alcohol which has one secondary and two primary alcoholic groups. The secondary alcoholic group will react with some acids and acid salts in an entirely different manner from the primary groups.

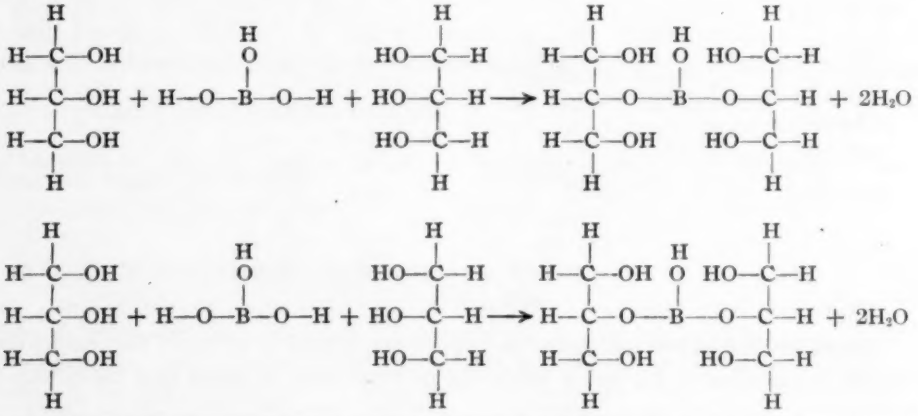
According to Gattermann in his "Practical Methods of Organic Chemistry," page 136, glycerin reacts with hydriodic acid to give Isopropyl Iodide.[1] This reaction can be explained by the following equation:



According to Bernthsen and Sudborough in their textbook on "Organic Chemistry," page 815, glycerin will react with monosodium dihydrogen phosphate in the following manner:[2]



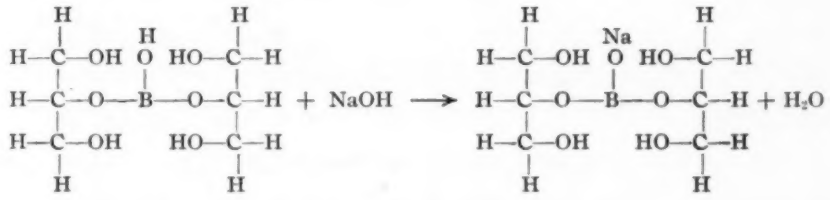
Using these equations as a starting point it is assumed that boric acid will react with glycerin in the following manner:



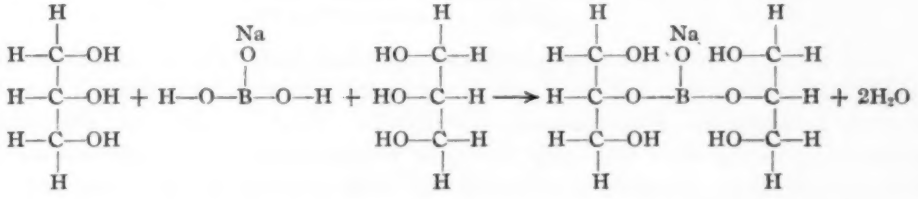
[1] Ludwig Gattermann, "Practical Methods of Organic Chemistry," page 136.

[2] August Bernthsen and John Joseph Sudborough, "Textbook of Organic Chemistry," page 815.

This explains why a large quantity of glycerin is necessary in the official assay of boric acid. This equation shows that for every molecular weight of boric acid 61.92 it requires two molecular weights of glycerin 2 (92.08) equals 184.16. It shows the reaction for the official assay.



Since sodium dihydrogen phosphate reacts with glycerin to give monosodium glycerophosphate $(C_3H_5(OH)_2)_2.PO_4Na$ it is reasonable to assume that sodium dihydrogen borate would react with glycerin to yield monosodium glyceroborate $(C_3H_5(OH)_2)_2.BO_3Na$ and is illustrated by the following equation:



This brings us to the consideration of borax and how it reacts with glycerin.

Borax is a salt which is alkaline in behavior. In the official assay of borax the U. S. Pharmacopœia directs to titrate with normal hydrochloric acid and to use methyl orange as the indicator.

The equation for the reaction may be represented as follows:

$$Na_2B_4O_7.10H_2O + 2HCl \longrightarrow 2NaCl + 4H_3BO_3 + 5H_2O$$

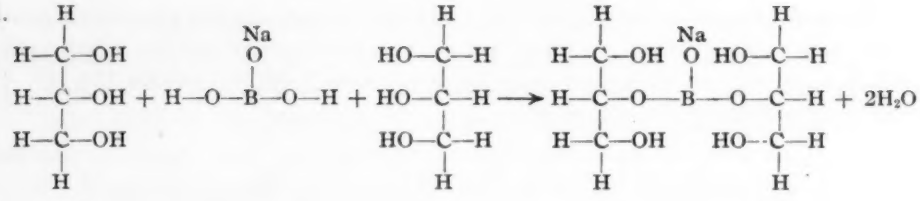
This gives borax a hydrogen equivalent of two.

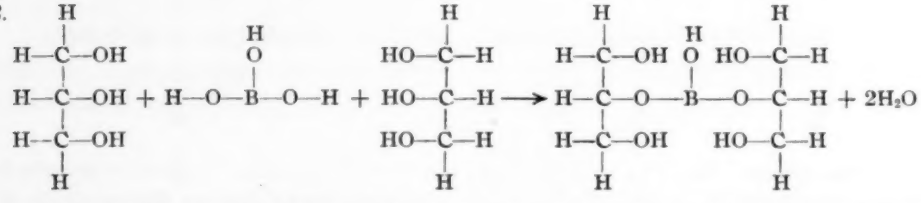
When borax is dissolved in water it is alkaline. If it is dissolved in glycerin, it is neutral, but when it is dissolved in glycerin with water, it is acid. The question now is, how can borax which is alkaline in behavior react with an alcohol to produce an acid? With the information we have on the reaction of glycerin with boric acid, we know that boric acid cannot be produced from borax in the presence of glycerin without forming glyceroboric acid.

If we study borax individually we find that in many of its reactions it acts like a metaborate. The best known of these are the bead tests in which we produce the metaborates. Again in treating calcium salts with a solution of borax, calcium metaborate is precipitated. This leads us to write the formula for borax as $(NaBO_2)_2.B_2O_3.10H_2O$ which shows the metaborate radical.

The sodium glyceroborate $(C_3H_5(OH)_2)_2.BO_3Na$ is neutral to phenolphthalein as was shown in the equation between glycerin, boric acid and sodium hydroxide.

We assume that when borax dissolves in water it undergoes hydrolysis to give $2NaH_2BO_3$ and $2H_3BO_3$. From the preceding experiments it suggests the following reactions with glycerin:

1.


2.


which shows that it will require eight molecules of glycerin for every molecule of borax. This may be represented by the following equation:

$$\underset{381.76}{Na_2B_4O_7.10H_2O} + \underset{736.64}{8C_3H_5(OH)_3} \longrightarrow 2(C_3H_5(OH)_2)_2.BO_3Na + 2(C_3H_5(OH)_2)_2.BO_3H + 13H_2O$$

The acidity here is due to glyceroboric acid $(C_3H_5(OH)_2)_2.BO_3H$ and since one molecule of glyceroboric acid reacts with one molecule of sodium hydroxide NaOH to give monosodium glyceroborate $(C_3H_5(OH)_2)_2.BO_3Na$, then one molecular weight of borax will react with eight molecular weights of glycerin if sufficient water is present to give a complete dissociation and yield a quantity of acid that will require two molecular weights of sodium hydroxide for neutralization when using phenolphthalein as the indicator.

One Gm. of borax is dissolved in water and made up to 100 cc. Ten cc. of glycerin are mixed with water and made up to 150 cc. Ten cc. of the glycerin and water mixture are put in a titrating flask of 250 cc. capacity. To this mixture 10 cc. of borax solution is accurately added from a burette. Two drops of phenolphthalein T.S. are next added and the solution is titrated with $N/10$ KOH until a pink tint appears.

In this case an excess of glycerin is used since it does not interfere with the reaction. The large quantity of water is used because it was found upon repeating the experiment many times that the end-point was more pronounced when the mixture was highly diluted.

An average of twenty-five experiments gave 5.2274 cc. of $N/10$ KOH for every 0.1 Gm. of $Na_2B_4O_7.10H_2O$. Since every cc. of $N/10$ KOH corresponds to 0.005611 Gm. of KOH, it is evident that 0.1 Gm. of borax reacts with glycerin to produce an acid requiring 0.02933 Gm. of KOH.

Therefore one molecular weight of borax, 381.76 Gm., will react with glycerin to yield a quantity of acid requiring 111.97 Gm. of KOH.

0.1 Gm. : 381.76 : : 0.02933 : X
X equals 111.97

According to our equation of glycerin, borax and water treated with potassium hydroxide, it will take two molecular weights of potassium hydroxide to neutralize the acid produced by one molecular weight of borax with glycerin, or 112.22 Gm. of KOH.

$$Na_2B_4O_7.10H_2O + 8C_3H_5(OH)_3 + 2KOH \longrightarrow 2(C_3H_5(OH)_2)_2BO_3Na + 2(C_3H_5(OH)_2)_2BO_3K + 15H_2O$$

$$\frac{111.97}{112.22} \times 100 \text{ equals } 99.78\% \text{ of the theoretical amount.}$$

The experiment was repeated twenty-five times using $N/10$ NaOH. It required an average of 5.21 cc. of $N/10$ NaOH. Every cc. of $N/10$ NaOH corresponds to 0.004 Gm. of NaOH. Therefore it took 5.21 $\times$ 0.004 equals 0.02084 Gm. of NaOH.

0.1 : 381.76 : : 0.02084 : X
X equals 79.5588 Gm. of NaOH

$$Na_2B_4O_7.10H_2O + 8C_3H_5(OH)_3 + 2NaOH \longrightarrow 4(C_3H_5(OH)_2)_2.BO_3Na + 15H_2O.$$

According to the equation it would require two molecular weights of NaOH, or 80.02 Gm.

$$\frac{79.5588}{80.02} \times 100 \text{ equals } 99.42\% \text{ of the theoretical amount.}$$

The experiment was repeated using $N/10$ Na_2CO_3 to effect neutralization. Since sodium carbonate breaks down to sodium bicarbonate first, and sodium bicarbonate does not respond to phenolphthalein indicator, the equation may be represented as follows:

$$Na_2B_4O_7.10H_2O + 8C_3H_5(OH)_3 + 2Na_2CO_3 \longrightarrow 4(C_3H_5(OH)_2)_2.BO_3Na + 2NaHCO_3 + 13H_2O$$

Every cc. of $N/10$ Na_2CO_3 corresponds to 0.0053 Gm. of Na_2CO_3.

An average of twenty-five experiments required 10.4 cc. of $N/10$ Na_2CO_3. Therefore 10.4 $\times$ 0.0053 equals 0.05512 Gm. of Na_2CO_3.

0.1 : 381.76 : : 0.05512 : X
X equals 210.43 Gm.

$$\frac{210.43}{212.02} \times 100 \text{ equals } 99.25\% \text{ of the theoretical amount.}$$

It was also found that if borax and sodium bicarbonate were mixed with about one-tenth the amount of water theoretically necessary to dissolve them and then the glycerin added that the effervescence was very rapid and would complete itself in fifteen minutes. When a large quantity of water was used to completely dissolve the borax and bicarbonate before adding the glycerin the effervescence was very slow and still showed reaction at the end of three hours. This is due to the carbon dioxide dissolving in the water and making the action reversible.

CONCLUSION.

Boric acid reacts with glycerin and water to form glyceroboric acid and water.

$$\underset{61.92}{H_3BO_3} + \underset{184.16}{2C_3H_5(OH)_3} \longrightarrow (C_3H_5(OH)_2)_2BO_3H + 2H_2O$$

Glyceroboric acid reacts with sodium hydroxide to give sodium glyceroborate and water.

$$(C_3H_5(OH)_2)_2BO_3H + NaOH \longrightarrow (C_3H_5(OH)_2)_2BO_3Na + H_2O$$

This accounts for the large quantity of glycerin required for the official assay of boric acid.

One molecule of borax reacts with water to give two molecules of monosodium dihydrogen borate NaH_2BO_3 and two molecules of boric acid H_3BO_3. Monosodium dihydrogen borate and boric acid react with glycerin to give monosodium glyceroborate and glyceroboric acid, respectively.

1. $(NaBO_2)_2.B_2O_3.10H_2O$
$2H_2O \quad 3H_2O$
$2NaH_2BO_3 + 2H_3BO_3 + 10H_2O$
2. $4C_3H_5(OH)_3 + 2NaH_2BO_3 \longrightarrow 2(C_3H_5(OH)_2)_2BO_3Na + 4H_2O$
3. $4C_3H_5(OH)_3 + 2H_3BO_3 \longrightarrow 2(C_3H_5(OH)_2)_2BO_3H + 4H_2O$
4. $Na_2B_4O_7.10H_2O + 8C_3H_5(OH)_3 \longrightarrow$
$381.76 \quad 736.64$
$2(C_3H_5(OH)_2)_2BO_3Na + 2(C_3H_5(OH)_2)_2BO_3H + 13H_2O$

The monosodium glyceroborate is neutral to phenolphthalein while glyceroboric acid is acid to the same indicator and causes the effervescence with the bicarbonate. Glycerin and borax mixed with water and sodium bicarbonate react to produce monosodium glyceroborate, carbon dioxide and water.

$$Na_2B_4O_7.10H_2O + 8C_3H_5(OH)_3 + 2NaHCO_3 \longrightarrow 4(C_3H_5(OH)_2)_2BO_3Na + 15H_2O + 2CO_2$$

John C. Krantz, Jr., asked the author if this explanation is incompatible with one he has given—that in the presence of glycerin, one molecule of borax decomposes into two molecules of sodium meta-borate plus one molecule of boric acid; and that, in turn, this boric acid reacts with the glycerin?

The author stated if that explanation is used, not so much glycerin would be required. In using a small quantity of glycerin, and then adding more, there is greater acidity.

HISTORICAL FRAGMENTS.*

BY EDWARD KREMERS.

No. 23. *Le Mort's "Pharmacia."*

Possibly the earliest textbook on pharmacy that bears the simple title "Pharmacy" is that of Jacobus le Mort published in 1684. Yet pharmaceutical historians all but ignore him and his treatise. Phillippe-Ludwig[1] dismiss him with mere mention and the record of five treatises, among them the

"Pharmacia et Chymia medico-physica rationibus et experimentis superstructa. Lugd. Batav. 1676, 1684, 1688, 1696."

Schelenz[2] copied only part of Ludwig's statement. Wootton does not mention him at all. LaWall[3] merely refers to him as the originator of paregoric, a statement apparently based on a semi-editorial comment in the *Chemist & Druggist*.[4] Medical historians appear to ignore him completely. Kopp, the chemical historian, twice refers to him: the first time[5] in connection with the general development of pharmaceutical chemistry and the rôle played therein by pharmacists; the second time[6] in connection with the special history of calomel. Poggendorff's account[7] is of necessity brief, but his treatment of the man and his writings is more

* Section on Historical Pharmacy, A. PH. A., Rapid City meeting, 1929.

[1] "Geschichte der Apotheker" (1855), page 580.

[2] "Geschichte der Pharmacie," page 550.

[3] "Four Thousand Years of Pharmacy," page 420.

[4] *C. & D.*, 62 (1903), 831.

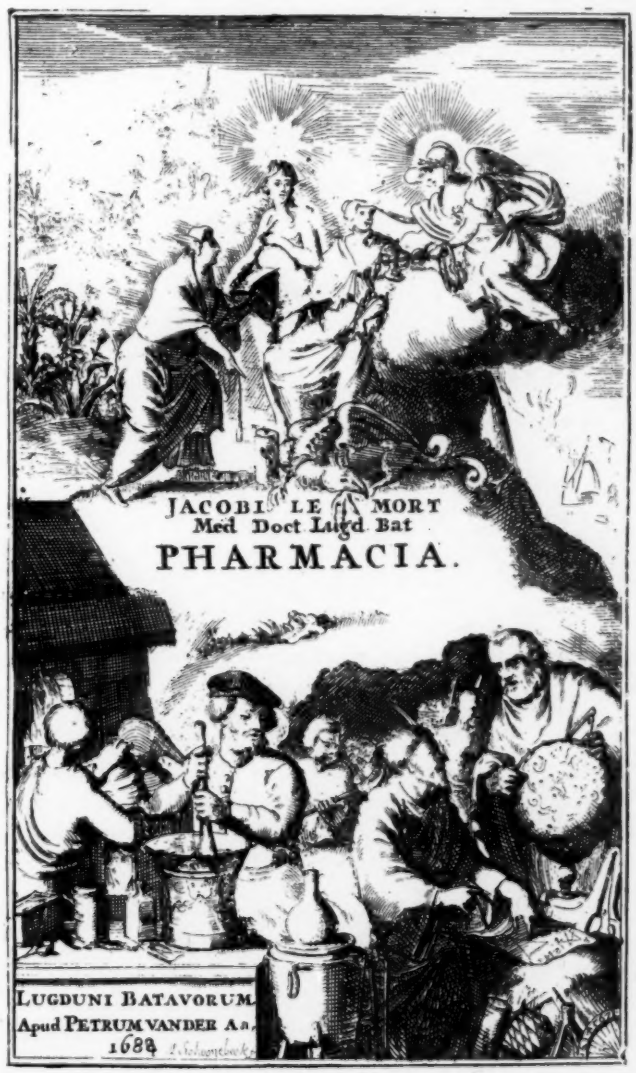
[5] "Geschichte der Chemie," Bd. II, page 116.

[6] *Ibid.*, Bd. IV, page 193.

[7] "Biographisch-literarisches Handwoerterbuch."

liberal than that of any of the pharmaceutical historians that have come to the notice of the writer.

Of his life, the texts referred to, give but the scantiest information.[1] Poggendorff states that he was born October 13, 1650 in Harlem[2] and that he died March 1, 1718, in Leyden. The only additional information given is that, like his father, at first he was an apothecary; that later he became a physician, and in 1702 Professor of Medicine and Chemistry at the University of Leyden. The writer of the article in the *Chemist & Druggist*[3] for 1903 in connection with his discourse on paregoric makes the following additional statement: "Le Mort was a Dutchman who taught chemistry and pharmacy, first at Leyden, afterwards at Utrecht.[4] At Leyden he was not in the regular faculty, and was forbidden to continue his lectures and fined.[5] At Utrecht he became authorized Professor of Chemistry. He died at Utrecht in 1718.[6]



Frontispiece with abridged title.—About the size of the volume.

Now, as to the one of his treatises of special interest to the student of the history of pharmacy, Poggendorff quotes the title as "Pharmacia, rationibus

[1] Unfortunately the references given in Poggendorff are not available.

[2] He also refers to the statement made by Joecher in his Allgemeines Gelehrten-Lexicon (1750) that he was born in Arnheim.

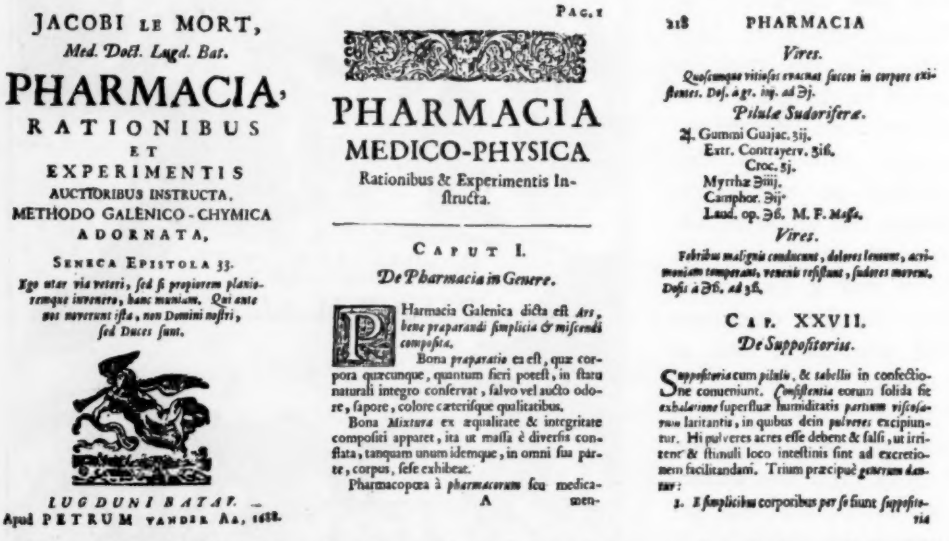
[3] Loc. cit.

[4] This statement appears to be out of harmony with the statement that he died in Leyden.

[5] Was this because he taught iatrochemistry?

[6] Note contradiction between this statement and that of Poggendorff.

et experimentis auctioribus instructa" (Pharmacy taught by means of theory and experiments) and gives the date as 1684. Phillippe-Ludwig quote the title as "Pharmacia et Chymia medico-physica rationibus et experimentis superstructa" and give 1676, 1684, 1688 and 1696 as the dates of the four editions. The Surgeons General's Library records[1] on hand his "Pharmacia medico physica, rationibus et experimentis instructa accuratiore methodo adornata. Nec non observationibus medicis illustrata" and gives the date 1684. The copy in the private library of the writer bears on the illustrated title page the single word "Pharmacia" as title. The tital page proper gives a longer title, *viz.*: "Pharmacia rationibus et experimentis auctioribus instructa, methodo galenico-chymica adornata" and bears as date the year 1688. On page 1 there reappears the abridged title: "Pharmacia Medico-Physica Rationibus & Experimentis Instructa" and as head



JACOBI LE MORT,
Med. Doct. Lugd. Bat.
PHARMACIA,
RATIONIBUS
ET
EXPERIMENTIS
AUCTIORIBUS INSTRUCTA,
METHODO GALENICO-CHYMICA
ADORNATA,
SENECA EPISTOLA 33.
Ego utar via veteri, sed si propiorem planioremque invenero, hanc muniam. Qui ante nos moverunt ista, non Domini nostri, sed Duces sunt.
LUGDUNI BATAV.
Apud PETRUM VANDER Aa, 1688.

PAG. 1
PHARMACIA
MEDICO-PHYSICA
Rationibus & Experimentis Instructa.

CAPUT I.
De Pharmacia in Genere.

PHarmacia Galenica dicta est *Ars, bene praparandi simplicia & miscendi composita.*
Bona *praparatio* ea est, quæ corpora quæcunque, quantum fieri potest, in statu naturali integro conservat, salvo vel aucto odore, sapore, colore cæteriſque qualitatibus.
Bona *Mixtura* ex æqualitate & integritate compositi apparet, ita ut massa è diversis conflata, tanquam unum idemque, in omni sua parte, corpus, sese exhibeat.
Pharmacopœa à *pharmacorum* seu medica-
A men-

218 PHARMACIA

Vires.
Quoscunque vitiosas evacuat faces in corpore existentes. Dos. à gr. iij. ad ℈j.
Pilulæ Sudoriferæ.
℞. Gummi Guajac. ʒij.
Extr. Contrayerv. ʒiß.
Croc. ʒj.
Myrrhæ ℈iij.
Camphor. ℈ij.
Laud. op. ℈ß. M. F. *Massa.*
Vires.
Febribus malignis conducunt, dolores lenunt, acrimoniam temperant, venenis resistunt, sudores movent. Dos. à ℈ß. ad ʒß.

CAP. XXVII.
De Suppositoriis.

Suppositoria cum *pilulis*, & *tabellis* in confectione conveniunt. *Consistentia* eorum solida sit *exhalatione* superfluæ humiditatis *partium* viscosarum laritantis, in quibus dein *pulveres* excipiuntur. Hi pulveres acres esse debent & salsi, ut irritent & stimuli loco intestinis sint ad excretionem facilitandam. Trium præcipuè *generum* dantur:
1. E *simplicibus* corporibus *per se* fiunt *suppositia*

These pages are very much reduced as can be seen by reference to Frontispiece.—Left, Title Page. Center, Page 1 of the text, with its definition of Pharmacy. Right, Page 218, closing chapter on pills and beginning of chapter on suppositories.

lines on the pages of the text there appear the words "Pharmacia" and "Medico-Physica" on the opposite pages.

Whereas the Catalogue of the British Museum records the titles of a number of chemical and medical treatises by le Mort, it does not record that of his "Pharmacia." The Congressional Library does not appear to house a single one of his books. Bolton in his "Bibliography of Chemistry" mentions the chemical treatises of le Mort, but not his "Pharmacia."

So much for the title and for the libraries known to contain copies of one of the four editions mentioned in Phillippe-Ludwig. Naturally the nature of the book is of greater interest to the pharmaceutical historian than mere bibliographic information about the several editions.

Some idea of the character of the book may be gleaned from the four facsimile reproductions of as many pages:

[1] Surg. Gen. Cat., 2nd Series.

1.—The frontispiece with its abridged title.

2.—The title page proper.

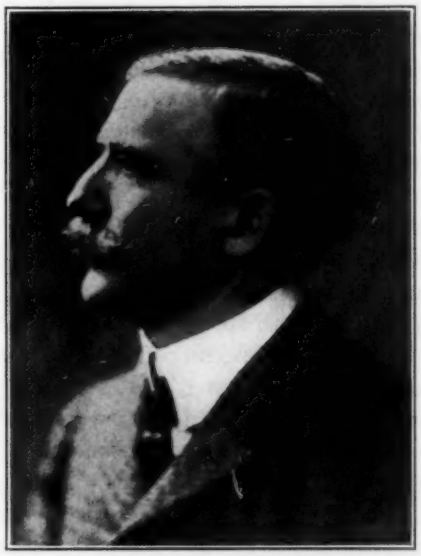
3.—Page 1 of the text with its definition of pharmacy.

4.—Page 218 of the text containing the last formula of the chapter on pills and the introductory paragraph to the chapter on suppositories.

In addition, the index to the chapters has been copied so that the reader may obtain a more comprehensive idea of the scope of le Mort's treatise. It will be observed that after Chapter XVII "On the composition of medicaments" the remaining chapters are devoted to what we commonly call galenicals, but that such galenicals as tinctures and extracts are conspicuous by their absence. These "galenicals" were introduced by the iatrochemical school.

INDEX CAPITUM.

Cap. I. *De Pharmacia in genere.*
II. *De Principiis Pharmaciae Fundamentalibus.*
III. *Explicationem horum Principarum continet.*
IV. *Fluiditatem particularum explicat.*
V. *Soliditatem particularum investigat.*
VI. *Divisionem Pharmaciae exhibet.*
VII. *De Collectione Simplicium.*
VIII. *De Simplicium viribus.*
IX. *De Praeparatione Corporum Viscosorum.*
X. *De Praeparatione Corporum Ramosorum.*
XI. *De Praeparatione Corporum Viscosoramosorum.*
XII. *De Praeparatione Corporum Terrestrium.*
XIII. *De Simplicium partibus constituentibus in mixtura naturali.*
XIV. *De Subterraneis.*
XV. *De Simplicium varia alteratione in mixturis.*
XVI. *De qualitate Corporum immutanda alteranda.*
XVII. *De Compositione Medicamentorum*
XVIII. *De Syrupis.*
XIX. *De Aquis.*
XX. *De Vinis, Acetis & Cerevisiis medicatis.*
XXI. *De Decoctis.*
XXII. *De Conservis & Pulpis.*
XXIII. *De Electuariis.*
XXIV. *De Trochiscis & Tabellis.*
XXV. *De Pulveribus.*
XXVI. *De Pilulis.*
XXVII. *De Suppositoriis.*
XXVIII. *De Oleis expressis & coctis.*
XXIX. *De Balsamis.*
XXX. *De Vernicibus.*
XXXI. *De Ungventis.*
XXXII. *De Emplastris.*



HENRY S. WELLCOME, London.

For more than 50 years an active A. PH. A. member.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

SALESMANSHIP PROBLEMS IN DRUG STORES.

BY PAUL C. OLSEN.

The familiar "companion" or "suggested" sale is the form of salesmanship most frequently recommended for use in drug stores. The theory is that if the hundred people who come in a drug store are each asked to buy an additional 25-cent item the store's receipts will be swelled by the amount of these additional sales which were made (supposedly) at no extra selling cost, with the result that practically all the gross profit on them is net profit. If fifty of the hundred people so asked actually do buy the additional 25-cent item, the store's sales for the day are thus increased by $12.50.

Some of the peculiar conditions incident to the retail sale of merchandise in drug stores make the "companion" or "suggested" sale an extremely hazardous and costly way to attempt to increase sales and profits.

One of these special conditions is the fact that regular customers visit a drug store twice a week or oftener. It is a physical impossibility for the proprietor and his sales people to remember, therefore, who have and who have not had their attention called to the additional 25-cent item which is being "pushed," especially if there are several salespeople in the store. Thus regular customers upon whom the store must depend for its continued success are put in the position often of saying "No" to the same request twice or more in one week. Naturally they resent these repeated importunities and are quite likely to transfer all their succeeding purchases to stores in which they will not be thus annoyed.

The second special condition which operates to reduce the effectiveness of "companion" or "suggested" sales in drug stores is the fact that practically all the people who come into drug stores have a definite purchase in mind before they come inside. They are not shoppers. All too often they have or feel that they have neither the time nor the inclination to listen to a sales talk. Thus the frame of mind of large numbers of drug stores' customers is one which certainly is not most conducive to the success of extra selling effort.

One of the elements of success in personal salesmanship is a knowledge of the individual peculiarities and characteristics of customers as well as the frame of mind in which they appear to be when a special personal selling effort is undertaken. The retail drug store salesman who serves 100 and even 200 customers in

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a day is in a far different position in this respect than is a traveling salesman who makes, perhaps, 6 to 8 calls in a day. The drug store salesman counts himself fortunate if, as he should, he knows the names of the customers to whom he talks.

A fourth factor which operates against the successful use of the "companion" or "suggested" sale in retail drug stores is the small amount of the average purchase made in drug stores. The net profit on even a dollar sale is hardly ever more than 10 cents. The work of promoting additional sales in drug stores can be done more effectively, safely and profitably by window and store displays, and, in some instances, by advertising.

These statements about the weaknesses and dangers of trying to increase drug store business by companion sales should not lead anyone to conclude, however, that there is no place in the drug store for the practice of salesmanship. It does and should occupy a most important place. In any contacts between drug store salespeople and customers, the requisite personal characteristics for greatest success are so plain that a mere enumeration of them is sufficient. They are:

1. Truthfulness
2. Sincerity
3. Courtesy
4. Tact
5. Self-control
6. Alertness
7. Memory
8. Enthusiasm
9. Earnestness
10. Imagination
11. Knowledge
    a of customers
    b of merchandise

The group of customers upon whom personal selling effort can be used successfully and profitably are those who enter the store uncertain as to the particular thing they are going to buy. A person decides he wants a hair brush and goes to a drug store to get one. But there are hair brushes and hair brushes. Some sell for 75 cents and others for $75. Certainly this is a situation calling for all the resourcefulness the drug store salesman possesses plus the eleven characteristics listed above if he is to meet the desire of the customer with greatest profit to the customer, to the store and to himself.

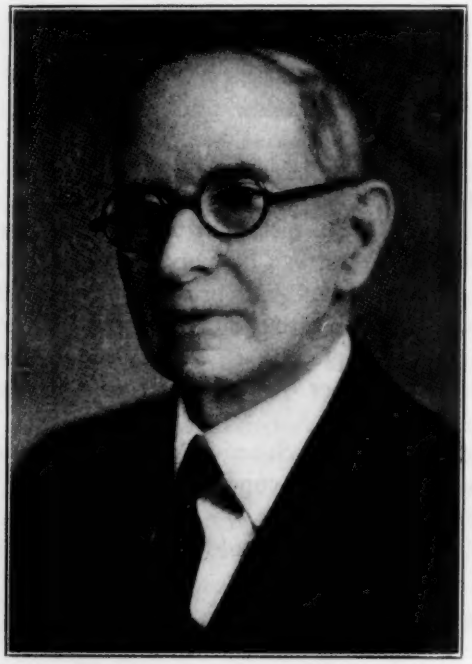
Hair brushes are only one of hundreds of items which are bought in this way in drug stores. Cameras, perfumes, stationery, sick room supplies and even candy have to be sold, usually, by personal effort of this kind.

Regarding such merchandise, the things a salesman should know in order to sell them most successfully are:

1. The uses of the article—the human instincts and characteristics it is intended to satisfy.
2. Style features, for it is natural for people always to be interested in something new and something different.
3. Where the article was made. "Paris" and "Bond Street" have a magic significance to prospective purchasers.
4. How the article is made. Seamless hot water bottles have advantages not possessed by other types.
5. The materials used in making the article. Stainless steel helps to sell many drug store items, tweezers, manicure articles, atomizers, etc.

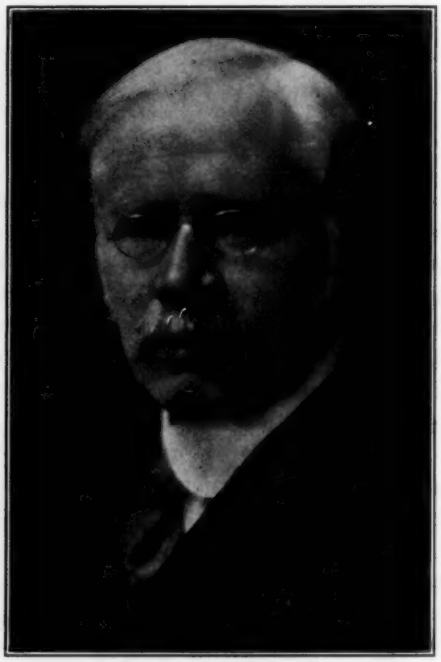
The source of much helpful information along the lines above is the manufacturer or wholesale distributor and the time to obtain this information is at the time the goods are bought. If a druggist has bought salable merchandise of the kind in which choice and selection on the part of the customer is involved, the druggist's answer to the following question will provide him, usually, with the facts which will make the most convincing presentation and the most profitable sale for all concerned. The question is, "Why did I stock this merchandise?"

The sale of merchandise of this kind presents in most drug stores practical difficulties, because usually the sales in drug stores are of merchandise on which the customer has decided definitely before entering the store. In a drug store employing only one or two salespeople, the necessity of spending 10 or 15 minutes demonstrating a camera may interfere seriously with the handling of other sales which are completed with less deliberation. This is an advantage which large drug stores employing numerous salespeople have, and explains why they have been most successful in the sale of merchandise requiring extensive demonstration and explanation.



JOHN URI LLOYD.

John Uri Lloyd was not only the oldest living Ex-President, A. PH. A. (1887–1888), in attendance at the Baltimore meeting, but also oldest member, 80 years. He contributed a paper on "Physics in Pharmacy," Part III, being a contribution of 50 years ago to the A. PH. A., now verified in laboratory, by Wolfgang Ostwald and Walter Haller.



EDWARD KREMERS.

Edward Kremers was formally awarded the Remington Honor Medal at the A. PH. A. meeting in Baltimore by New York Branch. The recipient has been head of the Course in Pharmacy at the University of Wisconsin for many years; he is president of Wisconsin Pharmaceutical Association, celebrating its 50th anniversary in July of this year.

ADDRESS OF THE PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.*

BY H. A. B. DUNNING.

The pioneer movement which resulted in the organization of the AMERICAN PHARMACEUTICAL ASSOCIATION was initiated by delegates representing the College of Pharmacy of the City of New York, the Massachusetts College of Pharmacy and the Philadelphia College of Pharmacy in October 1851, and the movement was supported the following year by the aforementioned colleges, joined by the Cincinnati and Maryland Colleges of Pharmacy, the Richmond Pharmaceutical Association and the apothecaries and druggists of the cities of Hartford and Middletown, Connecticut. The membership of the organization, its constitution, code of ethics, character, purposes and methods of procedure were then essentially the same as they are now.

H. A. B. DUNNING.

ITS PURPOSE IS TO SERVE.

The ASSOCIATION was founded to serve, and service has been and still is its great opportunity and vocation. Its service has been unselfish in every respect, not only in regard to its membership, but to pharmacy generally, the medical professions and more especially to the public at large. It has been responsible, from the very beginning, for the enactment of laws which govern the practice of pharmacy and the registration of pharmacists, inclusive of proper restrictive laws controlling the sale of poisonous and dangerous drugs. The ASSOCIATION, through its members, is not only responsible for the National Formulary and Recipe Book, but it is, in a large measure, responsible for the present state of perfection of the United States Pharmacopœia and for the standards which regulate the identity, purity and strength of drugs and medicines.

It has been most influential in promoting the advancement of pharmaceutical education, the establishment of many new colleges of pharmacy throughout the United States and extending coöperation and service to the members of the various pharmaceutical faculties. The ASSOCIATION is responsible for the origin of practically every type of pharmaceutical association in the country and this, particularly, applies to the state pharmaceutical associations and the splendid national organization of retail druggists, the National Association of Retail Druggists.

The names of men who have been members of this Association, who can truly be considered great by any standard, form such an extensive list that all could not well be mentioned in a short address of this kind. Some of these names are representative of the early beginning of the Association and are familiar to all

* Baltimore, Md., May 7, 1930.

of us: Procter, Squibb, Maisch, Parrish, Rice and others and, as a connecting link between the beginning and the present, we can readily recall the names of Ebert, Thompson, Sheppard, Hallberg and Remington. In later years we have become familiar with the names of Beal, Caspari, Hynson, Whelpley and others. These men, through their activities in the AMERICAN PHARMACEUTICAL ASSOCIATION, have provided a guardianship for the protection, advancement, development and progress of pharmacy as a profession and as an honorable calling. Without the stabilizing influence of this ASSOCIATION, it is doubtful whether the profession of pharmacy could have weathered the storms which have swept upon it within recent years.

In an editorial of a recent issue of *Industrial & Engineering Chemistry* there appeared an interesting definition of a profession, the essence of which is: that a profession is recognized by its literature, its organization, its code, written or unwritten, and its service to humanity. Pharmacy has all these things, organization, literature, code, all of which it is justly proud, and the AMERICAN PHARMACEUTICAL ASSOCIATION is the active exponent. It has a code which it respects and lives up to and our ASSOCIATION gives a great service to humanity.

CONSOLIDATION.

I have read the addresses of a number of my immediate predecessors in this office and I find myself in complete disagreement with the idea that our great ASSOCIATION could best serve itself and pharmacy through some kind of merger or consolidation with other large national pharmaceutical organizations. In my judgment, such a consolidation would destroy, not only the identity of the AMERICAN PHARMACEUTICAL ASSOCIATION, but, in a large measure at least, the value of its influence and service to its membership, other pharmaceutical bodies and the public. In my judgment, the activities of the A. PH. A. should be confined to those altruistic motives and opportunities for which it was organized. It has plenty of work to do through fostering, developing and protecting the educational and professional aspects of pharmacy and promoting those activities which will increase its service value. In other words, the A. PH. A. should remain a service institution, as it has always been, a stabilizing influence in pharmacy, with no selfish interests or selfish motives involved. Its power should arise out of its recognized value to the drug interests of every kind, state associations, national associations, educational institutions, pharmacy boards, enforcement bodies and to mankind in general. Our ASSOCIATION has a great opportunity and should not be led by any mirage of great power to consider the formula of a super-organization. Each of the national drug organizations has its own grave responsibilities and great problems and they should have our sympathetic coöperation on all general policies which come within the scope of our own activities, but we should not deal with any specific questions or problems that would lead to any misunderstanding respecting our motives or ideals. Our ASSOCIATION will give the most valuable service to all other associations if it devotes its time and interest to the promotion of pharmaceutical education, to the establishment of the professional status of pharmacy, to the promotion of its ideals and guardianship of its ethics. In return for this service, this ASSOCIATION should have the support of all phases of pharmaceutical interests, individually and collectively, both moral and financial.

Because of the value of the service which the ASSOCIATION gives and will give more and more to all pharmacy, its activities should be endowed, especially by the wealthier pharmaceutical interests, individuals and associations. Such endowments, in a large measure, have been accomplished already through contributions to the American Institute of Pharmacy and it is quite probable that complete endowment will be effected within the near future. Seemingly, the present outlook for pharmacy is none too bright, for it has ahead of it many obstacles to meet and many problems to solve, but it must meet and solve them, for the science of pharmacy is a necessity to mankind and always will be, irrespective of changing conditions and modifying influences. It is my belief, however, that the darkest days in pharmacy are passing and that a brighter future is in store for it. Out of the chaotic condition which exists at present there will come change and order. Disorganizing influences and those things which belong more properly to general commercial practice will drop away and pharmacy will come into its own again, stronger and better through its bitter experiences and its practices will become more profitable because of the initiative developed through competition and the application of better business methods. Higher education, greater self respect and the elimination of the professional inferiority complex will do much for pharmacy in the future.

COÖPERATION WITH THE AMERICAN MEDICAL ASSOCIATION.

Coöperation between the medical professions and pharmacy should be stimulated and developed whenever the opportunity may arise, for there are more drugs used to-day than ever before and more intensive researches are being made upon drugs by pharmacists to establish their value and more careful supervision is being exercised over their distribution. It is most unfortunate that the coöperation between the American Medical Association and the AMERICAN PHARMACEUTICAL ASSOCIATION is not closer and it is to be hoped that, within the near future, some means may be found to promote better relations on a basis of mutual self-respect and interest. There was a time, not so many years since, when greater coöperation was in force, especially in the work of that splendid body, the Council on Pharmacy and Chemistry of the American Medical Association, which has done so much for the benefit of medicine, pharmacy and the public, through its efforts to eliminate from medical use and public consumption many worthless and ineffective preparations offered for the treatment of the sick and the cure of the ills which mankind is heir to.

In the beginning, pharmacy was represented on the Council by several pharmacists who were among the most active in developing its plans and organizing its work and in promoting its progress and success. Both medicine and pharmacy will remember the pioneer work of Wilbert, Puckner and Hallberg. Dr. Puckner has devoted his lifetime to the work of the Council and with most excellent results, but Wilbert and Hallberg have passed beyond and their interest and influence is no longer felt in the Council; their vacancies have not been filled by pharmacists.

I recommend to pharmacy and suggest to medicine that consideration be given to this most unsatisfactory state of affairs, with the hope that some improvement may eventuate in the not too far distant future. It seems to me that such a Council would be more effective and its influence more widely felt if it were more

truly representative of medicine, chemistry and pharmacy and could avail itself of the special knowledge, reactions and experiences of representatives of the different groups.

I cannot well leave this subject without commenting upon the value of New and Nonofficial Remedies, published by the American Medical Association, which lists, describes and defines many valuable drug products, Council accepted, which cannot be found elsewhere. Every medical man should have a copy as a therapeutic guide and every pharmacist requires it as a reference book. This work has served a real purpose and its high character reflects much credit upon those who have been responsible for it.

Undoubtedly, pharmacy has much to account for and must get its house in order, much as medicine has done during the last decade or two. It would be good for pharmacy and helpful to medicine, I am sure, if some way could be evolved to bring about better coöperation between the two professions. I believe that when the American Institute of Pharmacy begins to function, which will be within the very near future, a more satisfactory relationship between pharmacy and medicine will eventuate.

THE ASSOCIATION'S OFFICES.

At this time I wish to make special mention and impress upon our membership the value of the services of your Permanent Secretary, Dr. E. F. Kelly, and Editor, E. G. Eberle, and make you aware of their unceasing activities and their strenuous labors in the interest of pharmacy in all of its various phases. It seems to me that your Secretary never sleeps, for he is always on his way somewhere, night and day, in the interest of pharmacy. To mention just a few of your Secretary's activities during my incumbency: numerous visits to Washington and exhausting conferences with various officials, commissions and committees related to or representing Public Health Service, Veterans' Bureau, the Army, Navy, Personnel Classification and others, all for the purpose of obtaining the recognition of pharmacy in Government service, with good results; conferences with the American Council of Education and various committee meetings for the purpose of promoting the survey of pharmacy and many other meetings and conferences, either individually or with his associates for the purpose of advancing the progress of pharmacy and obtaining its security; frequent visits to Washington to confer with the Secretary of the Fine Arts Commission and others in reference to the Headquarters Building, with satisfactory results. I have just begun to realize how hard your Secretary works and how effectively, and we owe him much appreciation and recognition. The following reports are based largely on the information obtained from him and, in some instances, through my own participation and experience.

RECOGNITION OF PHARMACY BY THE GOVERNMENT.

The A. Ph. A. has undertaken to obtain for pharmacy the recognition which it deserves and to improve pharmaceutical service in every governmental branch in which pharmacists are engaged. Conditions in the Navy are the most satisfactory and no effort is being made in that department at present. Pharmacists are employed in the Army and Navy as enlisted men and in the Public Health Service, the Veterans' Bureau and in the Prohibition (including narcotics) Bureau

as civil service employees. The Public Health Service is the only branch to require graduation in pharmacy as an entrance requirement. This is an important work and one of far-reaching influence on the future development of pharmacy. If pharmacy is recognized, as it fully deserves to be, as a public health profession by our national Government, this will not only effect national legislation of interest to pharmacy, but also state and local legislation; it will also promote a better appreciation of the service of pharmacy by the public. The effort to secure this recognition will be explained in greater detail by the Secretary and in the reports of several committees and I will confine myself to a few brief references.

PERSONNEL CLASSIFICATION.

In the original classification of governmental employees, some years ago, pharmacy was classified as a "sub-profession." In 1928, a re-classification was ordered by Congress. The A. PH. A. then filed a protest against this classification and requested that pharmacy be placed in the "professional and scientific" group, submitting data in substantiation. In October 1929, the ASSOCIATION was invited to a hearing before the full Personnel Classification Board, when pharmacy's claim to recognition as a profession was stated in full by representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. In particular it was emphasized that a sub-professional classification was unfair to and a reflection upon the thousands of pharmacists of this country who are rendering a professional service of acknowledged value in the conservation and improvement of the public health. In a preliminary report, just issued, pharmacists are classified in the Professional and Scientific Service and we are indebted to the Personnel Classification Board for their recognition of the justness of our claim.

THE ARMY.

Bills to create a Pharmacy Corps in Medical Departments of the Army lapsed when the 70th Congress adjourned in March 1929. The same bill was introduced in the present Congress in February and referred to the committees on Military Affairs, introduced in the House by Representative Reece, of Tennessee, H. R. 8473, and in the Senate by Senator Copeland, of New York, S. 3211. Our Committee on Pharmacy Corps has been active in interesting the members of the Committees in the measure and several have announced their approval of it.

THE PUBLIC HEALTH SERVICE.

The Parker Bill, H. R. 8807, passed the House on March 26th and the Senate on April 1st and was approved by the President on April 7th. It provides for the commissioning of pharmacists in the regular corps of the service on the same basis as physicians, dentists and sanitary engineers—Our first result.

THE VETERANS' BUREAU.

In December 1929, Representative Johnson introduced H. R. 6996 to create a commissioned medical service for the Bureau, consisting of a medical, a dental and a nurse corps. At present, physicians, dentists and nurses, as well as pharmacists, are civilian employees. The A. PH. A. promptly requested a hearing, which was

granted on March 19th, and with the support of the A. A. C. P. and the N. A. B. P., insisted that pharmacists should also be commissioned and submitted an amendment for a separate Pharmacy Corps.

I must also mention the activities of Winne, Swain, Hilton, DuMez and Eberle in connection with these efforts to improve the position of pharmacy in the Government service.

PHARMACY IN HOSPITALS.

The A. PH. A. became a member of the American Conference on Hospital Service in 1928, in order to better coöperate in the general improvement of Hospital Service. The pharmaceutical service in many hospitals is apparently unsatisfactory and would not meet the requirements of the various state laws regulating the practice of pharmacy. The requirements of a hospital, to be approved by the American Medical Association, do not mention pharmacy, although pharmaceutical service is one of the most valuable, as well as reponsible services in a hospital. The hospital pharmacy should be kept abreast of all improvements in modern pharmacy and in other branches of hospital service for the protection of the public. The A. PH. A. is in correspondence with the A. M. A. requesting that a requirement covering a modern hospital pharmacy be included with the other requirements of an approved hospital.

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

The pharmaceutical associations in most states have now reached the stage of development where they are really effective and influential organizations. This is also true of a growing number of local organizations. Realizing the desirability of an exchange of experience and information about the work of these associations, a conference of their secretaries was organized at the St. Louis meeting in 1927 and will hold its third annual meeting here. The organization needs stimulation and encouragement. By bringing together the secretaries of the state and local associations, it will be possible to coördinate the efforts which are being made for the advancement of pharmacy in the many states. Such a plan will work for greater uniformity in progressive organization methods and for a practical study of the best methods to adopt. Similar organizations in other professions are doing very effective service.

CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS.

Attention has been largely devoted to securing adequate laws regulating the entrance to and practice of pharmacy. These measures cannot produce the expected results unless the necessary machinery for enforcement is provided. There is a general realization of the need for law enforcement. The Conference of Pharmaceutical Law Enforcement Officials was organized at the Rapid City meetting last year, to bring those officials into personal contact for the purpose of exchanging information and improving enforcement procedures. Its first annual meeting will be held at this convention and those who are wisely promoting this organization should be given every encouragement and assistance.

The A. PH. A. has been the source of pharmaceutical organizations. The two conferences just discussed will prove to be as helpful to the cause of pharmacy as

have others in time and with proper support. In this year's program they have been given the same time as sections of the ASSOCIATION and they should continue to have this position.

I have always felt that the regeneration of pharmacy would come about through public demand when the public came to realize the importance and necessity of pharmaceutical service and it seems to me a good sign that many newspapers, magazines and scientific journals, in their columns, editorials and otherwise, are taking note of the disorganizing conditions which exist in pharmacy at present and, especially, in the retail drug stores. In most of these published statements ridicule is employed as a whip to sting our sensibilities, but, in many instances, the importance of pharmacy is recognized and the hope for change is voiced. Despite all this, the recognition of pharmacy as a profession is receiving more and more substantiation from men and institutions of the highest standing in the land. The American Council on Education, after a careful investigation, was willing and anxious to make a survey of pharmacy on the basis of a profession. It now remains only a matter of financing.

EDUCATION.

All schools and colleges of pharmacy holding membership in the American Association of Colleges of Pharmacy require for entrance evidences of the satisfactory completion of four years of high school work or its equivalent and as a minimum for graduation not less than 2250 hours of instruction, including oral lectures, personal laboratory work, recitations and reviews of which at least 1000 hours shall consist of lectures and recitations, such work to be given in a period of not less than three full college years of at least thirty weeks each. These institutions will require for graduation after July 1, 1932, not less than four full college years of at least thirty weeks. Eighteen schools and colleges now maintain a minimum four-year course. The time will come, I believe, when our colleges of pharmacy will train most, if not all, of the scientific specialists, especially the chemists, bacteriologists and, perhaps, the pharmacologists, who are becoming a part of the research organization of our manufacturing pharmaceutical establishments and elsewhere. Meanwhile, wherever practicable, opportunity should be made available in some of our pharmacy colleges for courses leading to a degree equivalent in value and training to the Doctor of Philosophy degree in chemistry, offered by our Arts & Science Universities.

REGISTRATION.

Each state in the Union and the District of Columbia has a law regulating the registration of pharmacists and the practice of pharmacy.

Forty-five states and the District of Columbia require graduation from a high school as a prerequisite to examination for registration.

Thirty-six states and the District of Columbia require College of Pharmacy training as a prerequisite to examination for registration.

All states, with one exception, and the District of Columbia, require practical experience as a prerequisite to registration toward which credit is given for college of pharmacy attendance. In a majority of cases, four years of practical experience is required.

The ASSOCIATION should provide for a Council on Education composed of members from the different groups, as is at present represented by the Committee on the Study of Pharmacy, which has functioned so effectively up to the point of obtaining the necessary funds for the continuation of a survey.

U. S. PHARMACOPŒIA.

Many of our members will go from our meeting to Washington, only a few miles away, to participate in the deliberations of the Eleventh Decennial Convention which will provide for the revision of the Pharmacopœia. The U. S. Pharmacopœia is a book of standards for the guidance and use of the medical profession and pharmacy and is the greatest book of its kind in the world. It is gratifying to know that our membership, from time to time and from revision to revision, have given greatly of their time and service to this work.

THE REMINGTON HONOR MEDAL.

The Remington Honor Medal is awarded by the Ex-Presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION and presented by the Senior Past-President of the New York Branch of the A. PH. A. in recognition of the highest services to pharmacy within the year and it is gratifying to our membership, especially us Baltimoreans, that the medal for 1930 was presented at our banquet last evening. It is well known that Joseph P. Remington was not only a great pharmaceutical educator, but a great leader in pharmacy, and was one of the most active and effective chairmen of the Pharmacopœial Revision Committee.

AFFILIATED ORGANIZATIONS.

We are glad to greet and have you meet with us the American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy, National Conference of Pharmaceutical Research, Plant Science Seminar, Conference of Pharmaceutical Association Secretaries, Conference of Pharmaceutical Law Enforcement Officials and other organizations that are working with us for the advancement of pharmacy. We wish them successful and profitable meetings and can assure them of our greatest interest, best good will and coöperation.

PHARMACY WEEK.

We congratulate the joint committee of the A. PH. A. and N. A. R. D. on the successful issue of Pharmacy Week and we believe that this undertaking has rendered a valuable service to pharmacy and we hope that the movement will continue to extend.

THE AMERICAN INSTITUTE OF PHARMACY.

Since the last report at the Rapid City meeting the subscriptions to this most important enterprise have increased to approximately $820,000.00, $480,000.00 of which have been paid in cash. Additional land has been purchased and architect John Russell Pope's office has practically completed the final plans for the building, subject, first, to the approval of the Plans Committee and then the Council. Only minor changes will be necessary and, within a few months, the building will be under way. There is enough cash in hand to provide for the land

and erect the building. Additional collections will be, approximately, sufficient to provide equipment and maintenance endowment for the building. Exemption from taxation is expected. The income of the Research Fund of the A. PH. A. consisting of $55,000.00, which is increased each year by one half the net income from the National Formulary, will be available for research in the new laboratory and the U. S. P. Convention is expected to set aside a fund of $50,000.00 of which the A. PH. A. will be trustee and the income of which will be allocated to research laboratory work. These sums will provide a nucleus for the research laboratory. Additional funds will eventually be required for research and the library and museum will need to be endowed. Certain new activities, which have either already been established or have been promulgated, will need to be provided for, such as an annual conference of the Secretaries of State Pharmaceutical Associations, the American Council of Pharmaceutical Education to direct and control education and registration in pharmacy, etc.

The income of the A. PH. A. from its dues will need to be employed for its current expenses. This means that the land, building, equipment and the necessities of the institution are provided for, but to have this fine institution function satisfactorily and to provide for the altruistic activities which will enable the A. PH. A. to develop as it should and pharmacy to properly benefit, one-half million of dollars or over is required as an endowment; this requirement has been recognized by influential friends to the cause and there is a strong probability that it will be forthcoming.

In my judgment, the Headquarters Building should be occupied by only service organizations and service institutions and there should not be representation of any organization whose activities will result in profits, if for no other reason than that the American Institute of Pharmacy will not be in a position to charge rentals if it expects to be freed from taxation. In the beginning, the organizations which should be represented in the building are the executive offices of the A. PH. A., the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the Committee on National Formulary and others of this character. A meeting place should be provided for secretaries of State Pharmaceutical Associations and other gatherings of this kind.

In this connection, I wish to acknowledge the great encouragement and assistance we have been so fortunate to receive from the Commission on Fine Arts and the Parks and Planning Commission of the Government. The members of these two bodies, which control the developments bordering on property owned by the Government in Washington, have shown a sympathetic understanding of what we plan and hope to accomplish in the Headquarters Building and their help has been invaluable.

It is a matter of sincere regret to those of us most closely in touch with this effort, that building operations could not be begun during this meeting. Such a representative gathering of pharmacists in this city and in Washington makes this a most opportune time to begin construction of the building which we have looked forward to and worked so hard for. However, the plans of the Government for this section of the Capitol City have been enlarged and extended recently and are not as yet completed. These modifications will greatly improve our site and its surroundings and mean so much to the complete success of our undertaking

that we must delay our plans. It is difficult to exaggerate the advantage of the location for our building and we trust that every one in attendance at this meeting will visit the site if they have not already seen it.

OUR PRESENT PROBLEM.

Probably the most serious problem pharmacy has to deal with at present is the overmerchandizing craze. It has become more and more difficult by viewing the outward and internal appearance of many drug stores to tell just what service they offer, whether they are drug stores, department stores or tea rooms. This should not be so and the practice will not survive, for the public needs and will demand professional pharmaceutical service free from the distractions of overcommercializing influences and environments. This public interest, I believe, should be regarded as a hopeful sign that the turning point for pharmacy has been reached, that the pendulum towards overcommercialism has swung too far and must swing back again. Public demands must be satisfied and it requires and must have professional pharmaceutical service, free from disturbing factors. There is much complaint by druggists in regard to the sales of drugs and medicines in other than drug stores. This represents an unfortunate situation indeed and should be corrected and, in a large measure, will be, I believe, some time in the future, not only as a result of prohibitive law, but through educational processes. The public will become informed and will realize that all drugs require special knowledge of their properties, such as effects of light, heat, storage, age, etc., and that they should be dispensed or sold only under the supervision of a registered pharmacist, who has received a liberal education in knowledge of drugs.

We must regain our professional influence and our prestige with the public. It is not so much the sale of package products of drugs and medicines in 5 and 10¢ stores that is disorganizing pharmaceutical practice as the display of alarm clocks, electric fans, can openers and the like and the sale of sandwiches and other foodstuffs and similar lunch-room operations in drug stores that alienate the interest of and also tend to destroy the respect of the public and of the merchants whose prerogatives and opportunities have been appropriated. I am confident that the powerful associations representing grocers, chain stores, department stores and other merchandizing agencies would recognize the value to themselves and mankind of limiting in a great measure the distribution and sale of drugs and medicines packaged or otherwise to regular drug channels if we would coöperate with them and restrict our encroachment upon their field of operations.

Law, prohibition and force are not effective unless equity is in the balance. I sincerely believe that large numbers of drug stores may be conducted in accordance with legitimate or ethical policies with acceptable side lines, with a greater measure of profit than results from the operations of the overmerchandized store. Package goods, representing quick sales and rapid turnover, may be sold with a small margin of profit, but compounded medicines or special orders should be subjected to service charges adequate to provide a reasonable profit and a living wage.

The future of professional pharmacy is assured despite its serious difficulties and its great problems, for so long as drugs and medicines which are poisons of varying degree are used in the treatment of the sick, pharmacy will remain of vital

importance to the welfare of mankind. Just as the lawyer guards the public wealth and material interests, and the physicians the public health, so does the pharmacist guard our lives, for one little error in dispensing or combining the drugs which are prescribed by the physician or obtained by our customers, may mean and sometimes does mean death. This the public must know, understand and appreciate. As regards our problems and difficulties, they are no greater than those of medicine, if so great, a few decades since, with its diploma mills, lack of education, training, experience, professional pride and interest. Much has been done to improve medicine and medical service through better educational requirements, prerequisite educational training, standardization and advancement of education leading to the medical degree, standardization of hospitals, better organization of its associations and their activities.

Medicine has earned and obtained the support of the public through its efforts to improve its service and because of its ability to educate the public to the value and importance of that service. We can and must do likewise and we are making substantial and steady progress through the improvement of our own prerequisite educational requirements, our advances in pharmaceutical education, our desires and efforts to solve our problems, improve our service to the public and educate the public to knowledge of its value. I maintain that these special altruistic problems and services and no other represent the prerogatives and duties of the A. PH. A. but it must have the support and coöperation of every national pharmaceutical association and the financial aid and interest of the wealthy individuals and corporations connected with pharmacy, for, unlike medicine, we have not as yet established the particular public appeal and we have no Carnegie or Rockefeller foundations to help us with financial aid and support. Our wealthy individuals and rich corporations must, therefore, help us, for we render to them a great and invaluable service. They must realize the commercial value of the great opportunity provided them of conducting their businesses under the protective influence of a privileged class with prerogatives and opportunities guarded and restricted to an extent not accorded other business enterprises.

While this is justly so, the equity will not remain, nor the opportunity, unless our professional qualifications justify it and our special service is understood and recognized by those who accord us special privileges, that is the public.

I believe that the A. PH. A. has the respect and confidence not only of its membership, but the rank and file of drug people in every branch of our calling to a larger degree than is true in any other instance of its kind.

I know that there has been and still exists some doubt of its initiative, virility and ability to do great things, but the A. PH. A. was never stronger than it is now, not perhaps in outstanding individuals, but in the numbers of well-educated, able, active younger men, of keen executive ability, determination and force, who are able and willing to carry through the policies of our ASSOCIATION.

Let us then, our membership and every pharmacist in the United States who has any interest in his vocation, give our confidence and support to the ASSOCIATION'S efforts to promote, protect and guard the professional, educational and ethical aspects of pharmaceutical service through the promulgation of the policies of the A. PH. A., in direct coöperation with the American Association of Colleges of Pharmacy and National Association of Boards of Pharmacy, with the interest

and support of all other national pharmaceutical associations operating together, in daily contact in our new grand American Institute of Pharmacy Building, which will be established within the year on its splendid site opposite the Lincoln Memorial in our nation's capitol.

CONCLUSION.

The Presidency of this ASSOCIATION is a great honor and a great responsibility. I deeply appreciate the opportunity of serving in this office and the fine coöperation which the other officers, the committees and the members have given me.

I am highly appreciative of the interest which has led many of our members from distant points to gather here to participate in the work and share the companionship and pleasures provided by our Seventy-Eighth Annual Meeting.

In particular I am indebted to my neighbors and friends who have spared no effort to promote the success of this occasion and, especially, do I acknowledge with grateful appreciation the untiring interest, guidance and coöperation of our Permanent Secretary, Dr. E. F. Kelly.

COÖPERATION WITH HOSPITAL PHARMACISTS.*

BY ERNEST E. IRONS, M.D.

Inspection and study of the hospital drug room will be of interest and profit alike to the administrative and professional members of the hospital staff. The superintendent will find here opportunities for justifiable economies, the existence of which he had not suspected. Attending physicians will be surprised at the large amounts of proprietary drugs which they are unthinkingly using in place of equally effective and less expensive pharmacopœial preparations, often under the misapprehension that the widely advertised proprietaries were accomplishing something more than the practically identical official drugs.

A closer acquaintance and coöperation between the hospital pharmacist and the members of the attending staff will be of mutual profit. The pharmacist will learn the problems which the staff has to meet, and the physicians can learn much concerning the composition and origin of new as well as of old remedies. In many hospitals the staff has failed to avail itself of the store of pharmaceutic information which may be had from the pharmacist for the asking, and the pharmacist has not taken as large a place in hospital conferences as he should. His function should not cease with supplying of drugs called for on prescription and the detecting of inadvertent errors of dosage, but properly should be extended in an informative and advisory capacity, under instructions given by the staff and medical superintendent, so that the hospital prescribing may be limited to remedies whose composition is known and whose use is approved by the best medical practice. The correction of habits of prescribing proprietary drugs in hospitals will go far toward eliminating confusion and improving the medical education of interns, nurses, the public and the attending physicians themselves.

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* From an article read before the Annual Congress on Medical Education, Medical Licensure and Hospitals, Chicago, Feb. 17, 1930, through *J. A. M. A.*, April 26, 1930, page 1278.

ADDRESS OF THE CHAIRMAN OF THE HOUSE OF DELEGATES.

BY R. L. SWAIN.

To the Members of the House of Delegates of the American Pharmaceutical Association:

From the substantive and structural standpoints it may be agreed that pharmacy needs nothing more in the way of organization. A review of the pharmaceutical profession and the closely allied drug industry will impress one with the thoroughness with which organizations have been perfected. The educational, registrational and professional needs have been met very effectively. The same may be said for the manufacturing, distributing and commercial interests. The organizations now functioning in the field are sufficiently inclusive. Every question of importance, be it fundamentally professional or fundamentally economic, can be submitted to some agency familiar with the principles involved. To recount these bodies would be to make a formidable array of groups well and favorably known. Many of them have records of accomplishments which mark milestones along the pharmaceutical highway. Each of them has performed signal service to that portion of the work to which it has been directed. The advances which have been made in the basic principles underlying pharmacy, the general upward trend in the manufacture, standardization and investigation of medicinal substances are due to the stimulating influences which have been exerted by the forces of organized pharmacy.

R. L. SWAIN.

Such an arrangement would seem to meet every legitimate need of pharmacy and the drug industry. However, a careful study of the matter will show that pharmacy and pharmacists have not made use of the organizational facilities as fully as the necessities of the situation demand. From the procedural standpoint pharmacy has not kept pace with the structural expansion. One difficulty with the present system is that there is a tendency upon the part of many organizations to pull away from the individual; to develop along purely organizational lines. In consequence of this attitude, there is evident an organizational complex. The relationship of the individual to the organization and of his relationship to the problems at hand have been subordinated to plans for organizational expansion. Many of the groups in the pharmaceutical field have been given to organizational thinking, resulting in a more or less inflexible organizational outlook. Obviously, such a viewpoint does not stimulate individual interest nor does it attract individual coöperation. To be most effective organizations must be responsive to individual problems. It would seem especially necessary to educate pharmacists to the wide facilities afforded and to point out to them the procedural facilities which the organizations provide for the solution of individual and collective problems.

A careful study of the development of the AMERICAN PHARMACEUTICAL ASSOCIATION during the last decade will show that it has been conspicuous in its efforts to deal with the basic and individual problems of the pharmacist. Such an attitude in fact was to have been anticipated. There is no pharmaceutical organization to be found which has maintained a closer relation to pharmaceutical problems. The history of the AMERICAN PHARMACEUTICAL ASSOCIATION embraces all that is sound, constructive and intrinsically fine in the development of pharmacy in this country. From the outset down to the present moment it has remained true to the highest ideals. It has exerted its influences to a realization of these ideals. It has thrown the full weight of its prestige to every effort to advance the standing and worth of the profession. The position of pharmacy to-day, from the professional and functional standpoints, is due almost entirely to the stabilizing of deep-rooted judgment of this ASSOCIATION. Others have been tempted to follow the will-o'-the-wisp of superficial movements; some have confused the shadow with the substance of things; still others have failed to distinguish between the slow-moving yet fundamental essentials of progress and the froth of a quickly passing storm. On the other hand, the AMERICAN PHARMACEUTICAL ASSOCIATION has been able, almost by inherent intuition it seems, to see things clearly and to keep its course true to fundamental conceptions.

The soundness of the position which the AMERICAN PHARMACEUTICAL ASSOCIATION has maintained is given special emphasis by the efforts which it has made to reach the needs of the individual pharmacist. The pharmacist has been accepted as perhaps the most important factor in the whole scheme of pharmaceutical organization. To meet his needs, to provide him a common meeting place where his difficulties might be discussed and where plans for mutual progress might be laid, the ASSOCIATION instituted the formation of state pharmaceutical associations. With these organizations an actual fact, the way was provided for concerted effort in the individual states. Just how effective these organizations have been is to be ascertained by a glance over the country as a whole. In every state the laws restrict the practice of pharmacy to those meeting a state-prescribed standard of education; in many cases pharmacy has been accorded a place in the system of public education; the profession has been called upon officially in many instances, to coöperate in maintaining the public health. The secure place which pharmacy occupies in the professional life of the states is due in a very direct sense to the consistent and persistent work which the AMERICAN PHARMACEUTICAL ASSOCIATION has carried on throughout its long and honorable career.

The formation of the state associations was but the beginning of the work which this organization has done to touch the life and the problems of the individual pharmacist. The present set up of the ASSOCIATION'S activities is simply a translation into practice of its original purpose and desire. Comparatively recent trends of thought, culminating first in the creation of the House of Delegates and later in the establishment of the Conference of State Pharmaceutical Association Secretaries and of the Conference of Pharmaceutical Law Enforcement Officials, are emphatic of the resourcefulness and responsiveness of this ASSOCIATION. The significance of these developments is made profoundly important when their relationship to the individual pharmacist is seen. The House of Delegates, as its name indicates, is a body of delegated authority. Reference to the

rules governing this House will show that every state pharmaceutical association is entitled to voting representation. Such an arrangement places the House of Delegates largely under the control of the state associations, and thus in the hands of the practicing pharmacist. Here has been provided a real federation of pharmaceutical interests. As was so ably said by Dr. James H. Beal, the House of Delegates "is a real clearing house for pharmacy and affords the means whereby the state associations may, through their representatives, confer upon policies of common interest and also where the great national organizations of pharmacy may meet and coördinate their respective policies with each other and with the state societies." The House of Delegates thus constitutes a vital influence in pharmacy; its potential force is almost without limitation. It is the one place where state views may be given a national expression; where the problems affecting pharmacy in one state may be met with the forces which have resolved them in others; where diverse sectional views may be welded into a policy applicable to the needs of pharmacy everywhere. The House of Delegates affords an opportunity for the advancement of every pharmaceutical purpose. It is especially adapted to the needs and problems of individual pharmacists. It reaches out and touches his daily work. It provides the place where his hopes and ideals may be enlarged to embrace a national outlook.

The value of the AMERICAN PHARMACEUTICAL ASSOCIATION to the individual pharmacist has been further expounded in the Conference of State Pharmaceutical Association Secretaries. This group provides a meeting place for those who are concerned with administrative problems in their own states. There is no field which presents greater need for a pooling of interests, for an understanding of individual problems, for a franker discussion of method and procedure than that dealing with the development and management of state associations. It is quite obvious that these groups depend upon a sound promotional program for their continued usefulness. For this reason nothing is so conducive to morale, to the maintenance of a constructive outlook, than meeting around the council table to discuss with others mutual problems and mutual needs. This conference is devoted to a consideration of the problems met with in association direction and is capable of great good. It can indeed be made the stimulating influence behind the work which the state associations are doing and must continue to do.

It would be difficult to overestimate the importance of the Conference of Pharmaceutical Law Enforcement Officials. There is a growing tendency to look upon law enforcement as the most urgent need confronting pharmacy to-day. To say that the public security demands an enforcement of the pharmacy laws of the several states is simply to state the elementary conception from which these laws have sprung. Therefore, in law enforcement pharmacy is simply making effective the responsibilities imposed by law. It requires little study to establish the direct connection between law enforcement and public security and law enforcement and professional advance. The maintenance of an acceptable legal status is essential to the professional position which pharmacy occupies. It is a field meriting most careful and considerate study. The conference, which has just been instituted in the AMERICAN PHARMACEUTICAL ASSOCIATION, marks the sound attitude which this ASSOCIATION has to this important work. This movement is directly concerned with stimulating the factors upon which the public regard for

pharmacy depends. It touches very acutely the welfare of the individual pharmacist. It may indeed be the answer to many of his problems. It certainly does hold out to him promise of future security and stability.

It would be possible to extend this discussion of just how closely the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION touch the life of the individual pharmacist and how essential its efforts are to the welfare of all pharmaceutical interests. It is sufficient, however, to restate that the ASSOCIATION has ever remained true to its original purpose of developing pharmacy as an essential element in the security, health and welfare of the public. Its facilities are broad enough, comprehensive enough and deep enough to meet in a serious way any problem which pharmacy may present. The limitations to its usefulness are those which the profession itself imposes.

This brings this discussion back to the principle that there is need to stimulate pharmacy to a fuller use of the facilities which organization has made available. This is indeed about the only thing required to make pharmaceutical progress both uniform and certain. This need should be emphasized time and time again. Every branch of pharmacy, and especially that embraced in the activities of the practicing pharmacist, should be directed to the facilities afforded. Great use should be made of the opportunities for collective study of local problems. The future will be bright with promise if the means available for progressive work are utilized as fully as they themselves permit.

The annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION should be the outstanding event in pharmacy. It represents the most comprehensive agency in the entire field. It is the only place where every pharmaceutical problem and every pharmaceutical interest may receive consideration. It provides the most dynamic force for the continued development and advancement of the profession. It should be our determined purpose to encourage pharmacists everywhere to make greater use of its resources and to rely upon its strength in meeting the exacting responsibilities of the day.

The history of the AMERICAN PHARMACEUTICAL ASSOCIATION is a brilliant and stimulating record. It is indeed a great tribute to honesty in purpose and principle. The ASSOCIATION has always been conscious of its responsibilities to the public and to the pharmaceutical profession. To-day it is devoted to the same high purposes and to the same fundamental principles which have distinguished it in the past. Its potential power for future good knows no limit. Let us see to it that pharmacy is responsive to the great opportunities which the ASSOCIATION provides.

The future may be faced with an optimistic spirit. It will witness the full fruition of the forces which have long been at work for a finer and more useful profession.

THE PHARMACEUTICAL SOCIETY OF JAPAN OBSERVES THE 50TH ANNIVERSARY.

The 50th anniversary meeting of the Pharmaceutical Society of Japan was held April 19th and 20th. The function was attended by more than 200 delegates from all parts of the Empire, and a large number of delegates were added from the resident members of Tokyo. The following officers were elected: *President,* Dr. Saburo Takahashi; *Vice-President,* Dr. Keizo Ikeguchi; *Secretaries,* Drs. Asahina, Keimatsu, Nishizaki, Uyeno. *Councillors:* Kondo, Hosoi, Kinugasa, Nabeshima, Ogata, Tanii, Hattori, Isono, Nakao, Nozoe and Taguchi.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

ADDRESS OF THE PRESIDENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

BY J. G. BEARD.

I wish very sincerely to express my appreciation not only for the honor you bestowed in naming me as your president, but for the generous assistance I have received from officers and members alike in carrying out the responsibilities that devolve upon the administrative officer. I wish I could believe that I have vindicated at least in small measure the faith you imposed in my ability, but candor compels the admission that my most earnest efforts have not satisfied the high requirements of the office.

J. G. BEARD.

COMMITTEES.

The first official action with which I was faced last year was the appointment of committees. Three principles governed the selections. *First*, distributing the appointees over as many member schools as possible; *second*, utilizing the services of an unusual number of younger men, but balancing the committees with older, experienced members; and *third*, but foremost, of course, selecting committeemen who would most likely perform acceptably every duty assigned to them. This is not said through belief that the appointments of the past year set an unusual standard of excellence, but simply to call attention to a theory that I believe each president should follow. A departure from the custom of the past three or four years was the naming by the president of every member of the Standing Committees, not merely the *chairmen*. Nothing in the By-laws covers this point and not enough is said in the By-laws about committees in general. It seems expedient to add an article specifically listing the standing committees, indicating how they shall be appointed and authorizing the creation of such special committees as changing conditions may require. I, therefore, recommend, (*a*) that this step be taken, and I further recommend (*b*) that a committee of five, headed by the chairman of the Executive Committee, be authorized to make a serious study of the Constitution and By-laws and submit at the meeting in 1931 such recommendations for revision as in its judgment are needed. Article 3 in the Constitution illustrates the need for a re-drafting that is found in several other places in the code. It relates to membership and is thus phrased: "The Association *shall*

consist of the colleges of pharmacy represented at the organization meeting of the American Conference of Pharmaceutical Faculties held at Richmond in 1900, and of those colleges of pharmacy which subsequently have been or *shall* be admitted to membership." Note the use of the word "shall."

Committee D on the Relation of Boards and Colleges is a Special Committee. I recommend that it be made a Standing Committee. An over-emphasis can hardly be placed upon the potential value of this Committee when or if it is allowed to operate in a logical manner. For this to occur there must be both an increase in the number of districts and a re-allignment of the states within each district. To illustrate: District 9 embraces Arizona, Alaska, California, Nevada, Oregon and Washington. The territory is obviously too extensive to permit the board and faculty members of all the states to meet together annually. District 8 presents a similar situation. Consequently I recommend (*a*) that a committee be appointed to confer with a similar committee from the National Association of Boards of Pharmacy for the purpose of re-districting the several states; (*b*) that the N. A. B. P. at its present session be requested to authorize such a committee; and (*c*) that the joint committee be empowered to act.

THREE TYPES OF MEMBERSHIP.

Reference a few minutes ago to membership requirements suggests that we might very well consider having three sorts of memberships: (*1*) Regular members, limited to colleges satisfying our every requirement. (*2*) Junior member, limited to schools that in every particular excepting the five-year age rule conform to our highest requirements. (*3*) Associate members, limited to colleges which in every particular save length of degree courses satisfy our highest requirements. Executive privileges would, of course, be allowed only to colleges of Group 1. The adoption of such a plan would likely cause the immediate membership of four colleges; the re-affiliation of at least five schools, and it would permit restricted membership to such colleges now regular members that may find it impossible to meet the four-year rule in 1932. Two opposing opinions will perhaps be aroused by a proposal of this sort. The one holds that such an organization as the A. A. C. P. should be open only to such colleges as can and will conform to the highest possible educational standards. The other recognizes (*a*) that a peculiar condition exists in pharmacy that has no parallel in other branches of education, and (*b*) that this organization can go farther and faster in encouraging higher requirements among all of the better colleges if it has a membership contact with them all. No recommendation is attached to the above-described plan for membership reorganization. It is offered merely for your consideration and only because of certain possible developments that would be very unfortunate both for this Association and for educational progress in pharmacy.

ALTERNATE DAY INSTRUCTION UNSOUND.

I have been reliably informed that certain schools in this Association still maintain a three-day-a-week schedule of class-room work. I feel certain that such a plan is pedagogically unsound. The requirements for membership make no reference to this point which leaves us in the implied position of supporting such a policy. This impels me to recommend that the following statement be

added to the first paragraph of Section 3, Article VI of the By-laws; ". . . such instruction to extend over at least five days of each active week of each school year." The complete paragraph would then read: "The institution shall include in its course of instruction, oral lectures, personal laboratory work, recitations, and reviews, such instruction to extend over at least five days of each active week of each school year." (The term active is employed so as not to make instruction mandatory during regular vacation periods.) I recommend further that this amendment be made effective on and after July 1, 1932.

AMPLIFYING ARTICLE VI OF THE BY-LAWS.

The third paragraph in Section 4, Article VI of the By-laws should now be amplified. It reads: "After July 1, 1932, member-colleges will require for graduation not less than four full college years of at least thirty weeks each." I recommend the following substitute paragraph: "After July 1, 1932, member-colleges shall require for graduation the satisfactory completion of not less than 3000 hours of instruction, of which at least 1200 hours shall consist of lectures and recitations and at least 1500 hours shall consist of laboratory work, such instruction to be given within a period of not less than four full college years of at least thirty-two weeks each. At least two months must elapse between each regular school session." I further recommend that on and after July 1, 1932, the above-quoted requirement shall replace the first paragraph of Section 4, Article VI of the By-laws.

VISITATIONS SHOULD BE CONTINUED.

I have followed with keen interest the plan undertaken three years ago to have each member school in the Association officially visited triennially by some responsible person for the purpose of focusing upon the school the friendly and constructive criticism of a competent outside observer. In my opinion the plan has been productive of real results that more than justified the costs and time involved in its operation. Since every member college has now been visited and a decision must be reached this year as to whether a new series should be begun I urge and recommend that the Chairman of the Executive Committee be authorized to continue the plan, following the same methods heretofore employed.

CLERICAL ALLOWANCE FOR ACTIVE OFFICIALS.

In no perfunctory manner I wish to call attention to the splendid service given this Association by the Secretary-Treasurer and the Chairman of the Executive Committee. One must deal intimately with the affairs of the organization fully to appreciate the prompt, efficient and devoted character of their work. Each receives an honorarium of $100 annually. Since this sum represents in no way an adequate reward for their services, and since neither will agree to its increase, the least we can do is to spare them certain clerical duties by appropriating to their uses an amount sufficient to employ part-time assistants when association business and college responsibilities unite to overtax their time. I recommend, therefore, that a sum not to exceed $250 a year be allowed each official for office expenses.

PREPARATION OF AN INDEX.

The proceedings of this Association are rich in material that often serves no purpose because it is not known about by the younger members or cannot be easily located by those who do know of its value. A master index covering every proceedings up to this time should be prepared by some member appointed by the incoming president, such index to be published in the next issue of the proceedings. I recommend that this be done.

PHOTOGRAPHIC DISPLAYS.

In my visits to various colleges in the Association I have been surprised that many of them do not possess, and, therefore, cannot display in their libraries or hallways, the pictures of teachers and scientists whose names are linked with notable achievements in the various divisions of pharmacy. On inquiry it developed that such pictures were lacking either because *the schools concerned could not afford expensive prints or because* they knew not where to secure photographs of size sufficient for display. I took the liberty, therefore, of asking Dean J. W. Sturmer, of Philadelphia, to secure from a reliable firm quotations on uniform size photographic enlargements. He reports that Mr. John H. Taws, located at 920 Arch St., Philadelphia, is prepared to furnish, at $2.00 each, stock reproduction of paintings of Liebig, Faraday, Davy and many other scientists prominent in chemistry biology, etc.; and will furnish 11 x 14 photographic enlargements of prominent pharmacists at $12.00 a dozen, or of size 16 x 20 at $18.00 a dozen, provided in the latter case that original photographs are submitted to him. Dean Sturmer reports further that his college can supply Mr. Taws with pictures of a considerable number of prominent earlier-day pharmacists. Historian Eberle of the AMERICAN PHARMACEUTICAL ASSOCIATION promises to make available for such purpose a large number of photographs stored in the archives of his ASSOCIATION. Dean Edward Kremers, of Wisconsin, possesses and would lend to a reputable firm a great number of pictures not only of men but of old appliances, famous apothecary shops, noted institutes, etc. He mentions Gutekunst, of Philadelphia, and the University photographer at Wisconsin as capable of making excellent reproductions. I believe that a real service would be rendered schools of pharmacy if Deans Sturmer and Kremers would undertake to collect and make available reasonably priced photographic enlargements of such material as is of historic interest to every pharmacist. If you agree that my representation of the situation is correct, I hope you will endorse the plan and request the two to execute it for us.

HISTORY OF MEMBER SCHOOLS.

The above paragraph brings to mind another mattery of history. Would it not be well to secure and store in our archives a summarized history covering the establishment and development of each of the schools holding membership in this Association? Many of our schools still number men who could prepare from memory interesting and important historic data about their institutions that have never been recorded but which should be obtained before it is too late and filed for future use. The securance of such data, if you believe it should be obtained, could best be done by an experienced student whom we should elect as Historian.

Surely this organization would profit from the services of such an official and in order to get the matter before you for action I recommend that the above plan be put into effect.

THE NEED FOR PROPER PUBLICITY.

Most of us have likely contrasted the national and local publicity given the annual meetings of this Association with that paid to conventions of other professional societies. The local papers give our meetings a perfunctory write-up and the national lay journals ignore our assemblage altogether. Is this because our conventions are wholly lacking in general reader interest, or is it because we are at fault in not initiating the publicity, or is it because we do not wish our proceedings advertised? In my opinion a useful purpose would be served by extensive publicity of a dignified character, and I hope that some plan can be evolved at this meeting calculated to give our proceedings such prominence as they are entitled to receive. It would impose too much upon the time and energy of our Secretary to ask her to undertake additional work, and so I suggest that each year the incoming president appoint a competent delegate to act as a reporter charged with the duty of selecting and offering for publication such material from our deliberations as would be of interest and value to the drug and lay publics.

EXCHANGE PROFESSORSHIPS.

For some time I have felt that pharmacy schools could profitably adopt a plan that is practiced in other divisions of education. I refer to Exchange Professorships. Such a plan is helpful alike to the schools and to the teachers temporarily transferred to other institutions. The teacher is himself broadened by his new contacts; the school to which he goes profits by his ideas and methods; and a more sympathetic understanding of mutual problems is enjoyed by the schools making the exchange. Most teachers tend to narrow their activities into environmental grooves when they stay year after year in the same college. This delimitation of energy, unconscious on the part of the teacher, is hurtful to the college and is corrected only by a transfer to other surroundings having different perspectives, values and methods. Leaves of absence are not always possible either because the teaching staff in smaller colleges is not large enough to absorb the absentee's load, or because the reduced income necessitated by employing a substitute causes a sabbatical leave to be too much of a sacrifice for a teacher with a family to make. If, however, he were going on full salary for a year to another institution with his place being taken by a competent exchange professor, his need and the need of the school for a change would be served without penalty anywhere. I recommend that this Association endorse such a plan and that it encourage pharmacy schools to follow the example of other professional schools and inaugurate a series of exchange professorships.

ENDOWED RESEARCH IN DRUGS.

Some months ago announcement was made that the late Stuart Wyeth, ex-president of John Wyeth and Son, had willed unconditionally the sum of $5,000,000 to Harvard University. Such bequests are not unusual but, unfortunately, they are nearly always made either to universities like Harvard, Princeton or Chicago,

that have no departments of pharmacy, or else for specific non-pharmaceutical purposes to institutions having schools of pharmacy. The result is that only on the rarest occasion does pharmacy participate in the gifts made. It is becoming increasingly the custom for persons of great wealth to make wills specifying that a generous share of their estate is to be used for educational and scientific purposes. I cannot but feel that pharmacy fails to benefit from such philanthropies because the donors were not made aware that the science of drugs is in crying need of funds with which to expand and extend its usefulness to humanity. The average layman looks upon health preservation and disease control as falling solely within the province of physicians, and when money is willed to further these ends the gift is made to institutions of medicine. The public is ignorant of the part that pharmacy plays in such a campaign and therefore fails to realize what a tremendous power for good would be set in motion were drug research properly endowed. No disparagement to the science of healing is intended and no invidious comparison is implied when the statement is made that medical science is being hindered in its progress because the study of medicines *per se* is subordinated to investigations less important. Research in other fields of human betterment is richly supplied with adequate funds and facilities, but extensive research in pharmacy is limited largely to drug manufacturers who, necessarily must commercialize more or less whatever results they obtain. The reason and the remedy for the paucity of real research in our field are obvious: Money! Men are available but means are lacking. If the actual situation were properly presented to the alumni of our colleges and by them passed on to men of wealth seeking a wise way in which to endow worthy causes I believe there would be a gradual awakening to wonderful opportunities hitherto neglected. Pharmacy and the public would, of course, profit from this form of beneficence. Feeling that this Association could engage in no more helpful effort than in studying ways and means by which to stimulate on the part of philanthropists interests in a work that now commands no interest I recommend that a committee of five be appointed to give this matter serious thought and report their conclusions at the meeting in 1931.

COUNCIL ON PHARMACEUTICAL EDUCATION.

In line with the adopted recommendation of President DuMez last year that a Council on Pharmaceutical Education be created composed of three members each from the American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy, and AMERICAN PHARMACEUTICAL ASSOCIATION, I took the liberty of asking Dean DuMez to present to the Executive Committee of this Association at its May meeting a model outline for the organization and guidance of such a council if or when it is authorized by the three associations concerned. His outline will have been acted upon too late for such action to be incorporated in this address, but anticipating its acceptance by the Committee I wish to recommend that machinery be set in motion at this meeting designed to secure the coöperation of the other associations and to hasten the appointment of the nine composing members so that shortly the Council can commence its activities.

ASSOCIATION DEVELOPMENT.

The American Association of Colleges of Pharmacy was established in Richmond in 1900 as a medium through which a variegated assortment of colleges

could work for the furtherance of their common good and for the promotion of such educational standards as would heighten the quality of pharmaceutical service. Beginning its career with the advent of the new century the Association entered upon a program of constructive accomplishment that seems greater now than was perhaps apparent at the start when enthusiastic courage and energetic faith blinded the organizers to the difficulties of their task. Thirty years ago not a state in the Union had a prerequisite law in force and only one or two had such a law in prospect. The preceptorial system was firmly established and majority opinion viewed it as satisfactory. Colleges of pharmacy not only did not have the sympathetic support of the mass of retail druggists but they were surrounded and in some cases almost stifled by a cramming system of instruction that offered a quick, cheap route to full licensure. This condition prevailed because druggists collectively and the people at large did not believe that legal requirements for pharmaceutical practice should embrace compulsory college training. The colleges themselves, with several noteworthy exceptions, were a heterogeneous group that in organization, aim, scope, curriculum and policy reflected a woeful lack of coördinated endeavor. Each was an independent unit in a competitive struggle that was in many instances based primarily upon numerical supremacy. The capital that such colleges invested in their students was expected to show profits, or at least no loss, and the quality of instruction was graded upon the amount of revenue received from tuition fees. Such a description hardly exaggerates the condition that faced the organizers of this Association when they met in 1900, and we need it as a background against which to contrast the developments of the past thirty years and with which to gage the character of our present problems.

RECOGNIZED LEADERSHIP.

I have just finished a rapid reading of the thirty volumes of proceedings that have been published by this Association. No one can do this without feeling a hightened appreciation of what the organization has been able to accomplish in its relatively brief period of existence. Here and there in the pages one comes across situations that were critical but which were handled with a diplomacy that averted serious trouble. At no time, however, did the organization appear to face a situation that offered the stern test and challenge that face those of us who are guiding its destiny to-day. Thus far the Association has made a number of distinct constructive contributions to the upbuilding of pharmacy, educationally, professionally and commercially. Particularly in the past few years has it achieved much of a progressive nature. At this time the Association is without doubt recognized as the leader in promoting educational standards in pharmacy. In this leadership it has the confidence and respect not only of other pharmaceutical bodies but of educational authorities generally. The sincerity and saneness of its efforts are now taken for granted. For these and other reasons it is in a position for the first time since its organization to assert its leadership. In so doing, however, we must all agree that it should not become over-zealous in its activities and make rigorous and exacting demands of its member schools. Instead it should use its new found strength in helping those schools which need help and should formulate its policies in such a way as to exhibit the highest degree of tolerance and patience that is consistent with steady progress.

THE CURRICULUM.

As we all know, the principal matter of business to be transacted at this meeting concerns the development of a model curriculum for the four-year course of study. Conflicting points of view will necessarily develop in formulating such an outline since widely divergent opinions are held upon the subject matter that should be taught in the baccalaureate course, but we can at least enter open mindedly upon a discussion of the Curriculum Committee's findings and, if necessary, make reasonable compromises even with deep-seated convictions.

SYMPATHETIC CONTROL.

This certainly ought to be done, for otherwise we shall reach an impasse completely blocking progress. This Association is composed of three distinctly different types of schools, each with its peculiar problems and each feeling that its destinies must be worked out in a particular manner. The facts are not exaggerated by the statement that upon the action we take in regard to the curriculum rests the question of whether we are to lose or to hold the membership of certain schools that have been affiliated with the organization since its founding and which would withdraw only with the deepest reluctance. Our attitude in fixing upon the character of the four-year course should be generous rather than autocratic. Not even what is pleasing to the greatest number but what is possible for each of our members should at least influence if not control our action in this whole question. The requirement of cultural subject matter in the new course illustrates my plea. There are several of our member-colleges that are not now organized and in the near future cannot organize to teach history, languages and other courses that University schools with their arts colleges can easily and without much added cost introduce into their curricula. What position shall this Association take toward such cases? Three courses are open. (*1*) We can say that the four-year course offered by a member school *must* include a fixed and liberal amount of prescribed cultural studies. If we do this we will likely cause the resignation of several schools that are doing excellent work and which for years have contributed to the progress of this Association. (*2*) We can say that if the baccalaureate degree is conferred by a member school the course leading to it must include a generous amount of cultural matter, but if, however, some other than the baccalaureate degree is to be awarded then the course may be composed almost entirely of technical subjects. (*3*) We can outline the length of the whole course in weeks, specify the minimum amount of technical training, and recommend but not make mandatory a specified amount of cultural study. Of the three courses open to us I earnestly recommend the last mentioned, not because I think it satisfies our educational requirements, but because after studying carefully all of the circumstances which are involved and weighing them in terms of fairness and expediency I believe it is the wisest course to pursue at the present time.

BUSINESS SUBJECTS NEGLECTED.

While on the subject of the curriculum I am forced by my convictions to reiterate what I have repeatedly said before this group on former occasions, namely, my belief that pharmacy schools generally should devote more consideration to the teaching of business subjects. Two aims should dominate our educational policy.

First, our curricula should be shaped and our teaching administered in such a way as to prepare our students to perform the highest, broadest, finest type of professional drug service that they in their generation may reasonably be expected to encounter. Vision and idealism should be generously used in formulating such a program with full consideration given to all trends that seem to have a developmental significance. *Second*, we should also train our students in such a way that as graduates they will not impose upon employers the job of teaching them business principles that can better be learned in college, and in order also that such graduates may have a practical knowledge beforehand of the duties they must inevitably perform as drug salesmen in modern drug stores. One fact, it seems to me, stays hidden from the sight of too many of us who teach pharmacy students. That fact is this: Retail Pharmacy always has been, is now, and always will be a specialized form of scientific commerce. That it has professional aspects no one can justly deny, but its predominating character cannot be changed by a pedagogical pretense that in the end fools no one. If those of us who teach pharmacy were compelled for one year to own and operate an average drug store, that is, actually practice retail pharmacy, and subsist wholly on the profits made therefrom, we would return to our class rooms with a new conception of what is demanded of present-day practitioners and, therefore, of what we should teach. We would be made keenly conscious of the fact that retail pharmacy is unquestionably a scientific business, and realizing this and realizing further that we will now have four years for the task we would be more prone to educate our students both for the science and for the business that they must inevitably practice. My whole argument is this: Superimpose instruction in scientific and business subjects on a cultural basis, and then emphasize science more than commerce, but when a foundation of liberal knowledge has been laid and a full measure of scientific material has been added, then finish the educational structure with what it needs in order completely to serve its purposes. Manufacturing and dispensing knowledge is essential for the protection of public health; cultural development is essential for the fullest measure of happiness; commercial knowledge is essential if the scientific practice is to pay for itself and the cultural element is not to be pecuniarily embarrassed. We should coördinate the three forms of knowledge in college where they can best be harmonized and assimilated. No amount of blinking can hide certain obvious facts that compose a condition and a challenge that are clear. Can we ignore them when we fashion our four-year courses?

SUMMARIZED RECOMMENDATIONS.

The recommendations in the foregoing pages are twelve in number. That they may more easily be examined I am summarizing them below.

I have recommended:

1. (*a*) That an Article be added to the By-laws dealing specifically with Standing and Special Committees. *See Par. 2.*

(*b*) That a committee of five be authorized to study the Constitution and By-laws and report in 1931 its conclusions concerning needed revisions. *See Par. 2.*

2. That Committee D (on the Relations of Boards and Colleges) be changed from a Special to a Standing Committee. Also that the several states be re-districted in order that Committee D may function more effectively. *See Par. 3.*

3. That beginning July 1, 1932, all member-schools shall adopt a five-day-a-week schedule of instruction. *See. Par. 5.*

4. That Section 4, Article VI, of the By-laws be amplified to cover the new four-year course, setting up 3000 hours of instruction and four years of thirty-two weeks each as minimum requirements. *See Par. 6.*

5. That official visitations to member-schools once in each triennium be continued. *See Par. 7.*

6. That the Chairman of the Executive Committee and the Secretary-Treasurer be each allowed not more than $250 annually for clerical assistance. *See Par. 8.*

7. That a Master Index of all Proceedings to date be prepared and published. *See Par. 9.*

8. That summarized historical data concerning each member-school be secured and stored in the archives of the Association by an Historian to be appointed. *See Par. 10.*

9. That the Association endorse the plan of Exchange Professorships. See *Par. 13.*

10. That a committee of five be appointed to determine if possible a practical means of stimulating interest in Drug Research on the part of philanthropists. *See Par. 14.*

11. That machinery be set in motion immediately to hasten the establishment of a Council on Pharmaceutical Education. *See Par. 15.*

12. That the Association outline in weeks the length of the four-year course, specify the minimum amount of technical subject matter, and recommend but not make mandatory a specified amount of cultural studies. *See Par. 20.*

CONCLUSION.

I am concluding this address without having considered subjects that I particularly wanted to dwell upon. So much time at this meeting must necessarily be devoted to the report of the Curriculum Committee that I deemed it unwise to take up more subjects than those I felt compelled to discuss. I wish finally again to thank you for the honor you conferred upon me and for the helpful assistance I have received throughout my tenure of office.

DECOMPOSITION OF ALKALOIDS IN SOLUTION, ON STERILIZATION.

A number of solutions of alkaloids were examined by the ultraviolet spectrograph by the Hartley-Baly method in order to solve the problem of decomposition on heating. *Atropine, Hyoscyamine and Scopolamine.*—By comparing the spectra of these three alkaloids with those of tropine and tropic acid, it is seen that the character of the spectra of the alkaloids is determined essentially by the tropic acid, and the changes of the three alkaloids on sterilization are to be referred mainly to changes in the tropic acid. The experimental method employed is not capable of deciding the nature of these changes. *Yohimbine.*—Yohimbine solutions undergo a continuous change both on keeping and on sterilization, often with the production of visible color. If the solution is heated in nitrogen instead of air, only slight changes occur at 100° C. It is therefore best to fill the ampuls in carbon dioxide. If this is not done, then sterilization should be carried out by Tyndallization, since the duration of heating is of less effect than the temperature. The solution should not be kept long.—*Quarterly Journal of Pharmacy and Pharmacology.*

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

ADDRESS OF THE PRESIDENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

BY JOHN A. J. FUNK, PRESIDENT.

Mr. Chairman, Fellow Members of the Association, and Friends:

The privilege of greeting you as your President at this the twenty-seventh annual convention of our Association is one of the happy moments of my life that I shall always remember. We are fortunate this year and honored by being the guests of a city richly endowed with such a colorful, historic background as Baltimore, situated within a few miles from our national capital, with its governmental, educational and historic significance, as well as beauty. While in Baltimore this week, there will be opportunity for a pilgrimage to historic Fort McHenry, where Francis Scott Key wrote our national anthem, "The Star Spangled Banner;" a visit to the tomb of Edgar Allan Poe; and possibly a trip to the United States Naval Academy at Annapolis, if there is time. Fort Carroll, also nearby, was built under the direction of Robert E. Lee, then a Colonel of Engineers in the U. S. Army.

JOHN A. J. FUNK.

Baltimore is also a city of commercial activity and has the second greatest industrial harbor in the country. Here, too, is the famous Johns Hopkins Hospital and Johns Hopkins University. The University of Maryland will this week dedicate a new building for its college of pharmacy, which will stand as a monument to the great strides being made in pharmaceutical education. Next week in Washington, we break ground for our American Institute of Pharmacy, heretofore known as the Pharmacy Headquarters Building, another big achievement for pharmacy. Our years of labor are bearing fruit and this is indeed a happy occasion.

U. S. PHARMACOPŒIAL CONVENTION.

Once in ten years we, as pharmacists, assemble with the medical and Government representatives at Washington in the United States Pharmacopœial convention. We must fulfill our professional obligation on this occasion to the very best of our ability in order to reflect credit upon pharmacy, thus counteracting the occasional criticisms which some are making of our honored profession because of the encroachment of merchandising and chain-store methods. In reply, let us point with pride to the part we play in setting and enforcing a standard for drugs and medicines.

The majority of our board members are retail pharmacists, and it is therefore of vital importance that their voices be heard in the deliberations next week in order that the practical aspects relating to the preparing, compounding and dispensing of drugs may be properly stressed. Since the Pharmacopœia sets the recognized government standard, it is very important that the standard be right and fair to all. I am happy to learn that so many of our delegates will represent their respective states at the convention, and I urge all of you, both delegates and non-delegates, to go to Washington and attend these meetings, thereby giving the support of your presence. Once in ten years the time can be spared, and you will find it well invested.

AFFAIRS OF THE ASSOCIATION.

As only eight months have elapsed since the Rapid City meeting, this has been a very short year. Therefore, whatever of shortcoming you may discover, your President will promptly blame upon the lack of time. The year as a whole, however, has been very satisfactory.

It is my pleasant duty to report that we have successfully weathered the threatened financial crisis and that f[illegible] first time in four years our income and expense accounts balance. Our ca[illegible]ste. July 1, 1929 was $12,214.09; on March 31, 1930—$12,771.33, a n[illegible]ease of $557.24 for the first nine months of our fiscal year, which will [illegible]e June 30, 1930. As this report was prepared for printing before the end [illegible]al, figures for that month could not be computed.

As most of you will remember, a [illegible]tial appropriation was set aside for the survey of pharmaceutical education [illegible] mount is included in the cash balance shown above, as only a small portion [illegible]e m[illegible]ey has been expended in preliminary work so far. Until the entire amount [illegible] to conduct the study is pledged, we shall not be called upon to pay up our [illegible]iption.

Comparing the figures for the nine months ending March 31, 1930 with the same months of the preceding year may prove interesting: Cash balance July 1, 1928—$13,203.99; March 30, 1929—$12,647.24; net cash *decrease* for the period $556.75 as against an *increase* this year of $557.24.

Inasmuch as the $25.00 fee became effective on January 1, 1930, it may also prove interesting to compare the first three months of 1930 with the corresponding months of 1929, when the $15.00 fee was still in effect. As a rule, corresponding months of different years run about the same. During the first three months of 1929, 266 applications were issued; during the same period in 1930, 205 applications, or 61 less in number this year than the preceding year. This should not, however, be interpreted as an indication that fewer blanks will be issued at the new rate. Inasmuch as advance notice of the increase was broadcast, many applicants who intended to take out reciprocal licenses in the near future, rushed to receive the advantage of the lower rate, with the result that 144 applications were issued during December 1929 as against 73 for the same months in 1928, or an increase of 71. Comparing the four months—December, January, February and March—this year shows 10 more applications issued for that period than the corresponding months of the preceding year.

LEGISLATION.

The combination of a short convention year and an off legislative year makes our report of legislation passed very brief. This happens to be the year in which only about 10 legislatures assembled. Those which convened in January are still in session and the few measures proposed which affect pharmacy are in most instances in the pending stage. Chairman Williams of the Legislative Committee will give you a detailed report on these. No advice has been received of college prerequisite bills being introduced in any state this past winter.

Next year, however, some forty odd legislatures will convene, including those of most of the states without college prerequisite legislation. Let me urge that these, through their state boards of pharmacy, their state pharmaceutical associations, and individual pharmacists, unite their efforts in a constructive campaign for the prerequisite. The four-year college course becomes effective in 1932. Since the conditions governing pharmacy are practically the same all over the country, there should not be such great variation in the entrance requirements for practicing the profession as there will be when most states are on a four-year college year college basis and a few remain on only the four-year experience requirement. As a majority of the states are now on a [illegible]ge basis and have found the effects of this requirement most beneficial to the [illegible]fare of both the public and the profession, the other states—only 12 in num[illegible]—should follow suit immediately.

DISTRICT [illegible]INGS.

The short year certainly did not in[illegible]e with the number of district meetings held, and this is undoubtedly due t[illegible]owing enthusiasm for more meetings, once a district gets started. Five [illegible]cs held meetings at which both boards and college faculties were represente[illegible]ing the period from January 1st to April 7th, as against three last [illegible] seven months' time. In fact, members of two more districts were dissuaded from holding meetings as the only time available was the latter part of April and it was felt that either the attendance would suffer on account of the closeness of the convention or states sending representation to the district meeting might be unable to send delegates to the annual convention. Meetings were held in Districts 1, 2, 4, 6 and 7; Districts 3 and 5 are planning sessions early in fall. In the western districts, we have been unable as yet to overcome the obstacle of distance. The traveling expense is so great that only one or two states of a district can promise attendance of a delegate and this is not sufficient to warrant calling a meeting.

The district chairmen are to be congratulated on accomplishing so much this year.

IN MEMORIAM.

At this time let us pause to honor the memory of our departed members. Five have been called from their labors since our last convention. We shall miss them; their places will not easily be filled.

Let us strive to carry on as they would have us, in such a manner that will bring honor to our Association and profession.

Harvey P. Bissell, Connecticut.
C. O. Ballou, Idaho.

Charles L. Joy, Idaho.
Frederick W. Archer, Massachusetts.
Harry W. Servant, Missouri.
Robert H. Walker, Texas.

At a later session, I shall call upon fellow board members of the departed to pay tribute to our members who have passed to their reward.

TOLERANCE.

While tolerance as a necessity in reciprocity has been called to the attention of the members of the Association almost every year, yet I believe the subject so important that it should be stressed again this year. When it is recalled that no two states have laws exactly alike, and that the rules and regulations interpreting these laws make for further variation, it will be clearly seen that in order to have reciprocity that is worthy of the name, we must have a tolerant spirit on technicalities and differences in laws and rulings when these come up.

Take, for example, the question of grades: I am informed that the laws of only a very few states specifically mention the grade standard in the reciprocal clause. When this is not done, the matter of accepting grades rests entirely with the discretion of the board. No applicant who registered prior to 1915, when there was no minimum examination or uniform system of grading, should be rejected because he does not come up to the present standard of 75% general average or minimum of 60% in any one subject. His many years of practice since registration attest to his competency and that is all the law contemplates. To give reciprocal recognition to another examining board implies faith in its examinations, system of grading and judgment. To refuse to accept grades which another board deemed worthy of a license under its system of examination in the early period before a minimum was adopted, is to question the good judgment of the examining board, especially when it is backed up by years of successful practice on the part of the applicant. A board that refuses such an applicant on this account certainly shows a "technical" rather than a "tolerant" spirit.

CONVENTION ATTENDANCE.

I am pleased to note that we have about the average number of boards represented at this convention. However, *every* board should be represented at *every* convention. As it is, some 30 odd states send delegates. Usually the same states are represented each year, and the other fifteen or more members are not represented and therefore not only lose contact with their Association, its needs and accomplishments, but also lose the benefit to themselves and the public of their respective states, which comes from contact and deliberation with other board members. Enthusiastic support cannot be gained nor benefit derived from a written report of a meeting, no matter how well it is done. Owing to the unique nature of our work, the complete understanding and whole-hearted support of every member board is absolutely essential, if we are to achieve the full measure of success. As the membership of boards changes frequently, sometimes in entirety, these new members must be made familiar with the work of the N. A. B. P. Personal contact with fellow board members at meetings is the only way this can be accomplished

satisfactorily. In fact, most public welfare bodies and even governors of states recognize this need and meet in national conferences annually in order to get the benefit of experiences and advice from similar groups in other states.

In a few instances, boards which have been unable to send representation to national meetings on account of the distance and expense *have* been able to send representatives to nearby district meetings and in this way, these meetings have been of tremendous help. However, attendance at a district meeting should not be considered an excuse for lack of representation at the annual conventions.

The foregoing is not meant as a criticism, but simply to emphasize the importance of convention attendance. The fact that our reciprocal difficulties originate, as a rule, in states which do not send delegates to the meetings, the reason being, of course, that these absentee states have not had the opportunity to familiarize themselves with existing or changed conditions, shows the necessity for convention attendance.

In most instances, the reason for non-attendance is that the state does not allow expenses for travel outside its own borders. As it is difficult to get a member to volunteer to make the trip at his own expense, one way to overcome this might be for these boards to arrange to pro-rate the expenses among the five or six members, electing a different member as delegate each year. This would distribute the expense. Also, in those states where no budget is available, board members will often find the state pharmaceutical association and other bodies willing to help when the condition is explained.

After all, there is no pecuniary profit from service on a board, and those who accept the honor should be willing to make the necessary financial sacrifice to keep pharmacy within the state up-to-date in its examinations, education, reciprocity, etc. Attendance at N. A. B. P. meetings with the added opportunity of contact with the college association and the AMERICAN PHARMACEUTICAL ASSOCIATION is the best and cheapest way of accomplishing this. It is really the duty of every board to find a way to send representation to these meetings.

HOME OFFICE.

During the past year, I have had the pleasure of visiting the home office on three occasions and observing the manner in which the work of the Association is being carried out. Only those who have had the opportunity of spending a day or even a few hours in the central office can realize how much time and effort it has taken to plan and equip it to handle its multitudinous duties and to gather and compile the statistical information on hand. It is to be regretted that so few of our board members can see the office and appreciate what is being done. I urge all of you who pass through Chicago on a trip to make the N. A. B. P. office your first stop.

Secretary Christensen and his assistants are to be complimented on the splendid work they are doing for pharmacy.

CONCLUSION.

Personally, I want to thank all officers and committees as well as members of the Association for the splendid assistance and coöperation which I have received during the term of my office. If this year has numbered accomplishments,

I acknowledge that I owe the success to those who have at all times been so willing to help and coöperate.

I have great admiration for the past of this Association and profound faith in its future. I believe that every penny which the N. A. B. P. has spent and is spending in its budgets for making reciprocity more general, assisting in legislation, rendering examination help, gathering statistics, promoting studies, etc., has yielded far greater returns for pharmacy and the practicing pharmacists of the country than could otherwise have been accomplished. Through this, we have learned the advantages of and necessity for coördination and coöperation in our efforts. We are no longer insular in our ideas. We have found out that what is good for one state is good for another, and thus are profiting by the experiences of other states and abandoning the slow method of working out our problems altogether by ourselves. The age in which we live demands efficiency and assumes a scientific, fact-finding altitude even in business. No one board has the resources to carry out such a policy, but by pooling our interests in our national body, the N. A. B. P., we are able to work out our problems mutually with modern efficiency and to be a strong force in the uplift of pharmacy to the professional status which it should enjoy.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

NEW YORK.

The April meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the College of Pharmacy, Columbia University, on Monday, the 14th, the chair being taken by President Robert R. Gerstner. About 75 members were present, of whom 31 attended the Get-Together Dinner which preceded the meeting.

The minutes of the March meeting were read and approved.

Chairman Lehman of the Committee on Education and Legislation, reported that the so-called "Druggists' Bill" was defeated in the State Assembly. He also stated that the bill, introduced by the New York State Pharmaceutical Association, embodying amendments to the pharmacy law of the State had passed both houses and was awaiting the Governor's signature. In regard to National Legislation, he reported on the present standing of the Capper-Kelly Bill, H. R. 11, the Williamson Bill, H. R. 8574, and the Johnson Bill, H. R. 6996; this last provides for a commissioned medical service in the Veterans' Bureau; the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association Colleges of Pharmacy and the National Associa-

tion Boards of Pharmacy are making strenuous efforts to have pharmacists included in the service.

Dr. Schaefer, in reporting for the Remington Honor Medal Committee, stated that Prof. Edward Kremers, of the Pharmacy Department of the University of Wisconsin had been elected to receive the Remington Honor Medal; that the award would be made at the Banquet of the A. PH. A. Convention on May 6th, at Baltimore.

A motion was made that the Branch meeting scheduled for May be omitted in view of the fact that the National Meeting is being held in Baltimore at the time.

Chairman Dyer of the Committee on the Progress of Pharmacy, gave a list of some new remedies and read several interesting abstracts.

The President then introduced Dean Ernest Little of the Rutgers University College of Pharmacy who outlined the Research Program of the college. Dr. Little said that, at the present time, they had two Research Fellowships, one established by Merck & Co. and the other by the Kraft-Phenix Corporation; besides this, all members of the faculty had opportunities for and were encouraged in, individual research. The Research Department, of which Dr. Lloyd K. Riggs is the Director, has contributed three important papers on "Digitalis" to the *Journal of Pharmacology and Experimental Therapeutics*. The Department has produced an Egg-Substitute Powder, having 98% of the efficiency of fresh eggs, and also Velveeta, which has become the best-selling cheese specialty on the market.

Dr. Little introduced Dr. Riggs, who spoke at length, with the aid of charts, on Vitamin B and its influence on the growth of animals; his work showed that this was lacking in the Wisconsin formula used in testing the growth of animals and that when it was added, healthy normal growth resulted. He said that the Department had recently prepared, from vegetable sources, a Vitamin A extract which was equivalent in Vitamin A potency to cod liver oil. He then spoke of the coöperation of the Department with the City Hospital and the Health Department of Newark; in this connection he mentioned an interesting case, in which a diagnosis of cancer of the stomach proved, from an examination of the gastric mucosa, to be erysipelas. In conjunction with Dr. Fronda he had worked out a method for the determination of the changes of hydrogen-ion concentration in bacterial cultures involving the use of only one loopful of material.

Dr. William Nyiri, introduced by Dr. Little, spoke of his work under the Merck Research Fellowship on the standardization of heart tonics by the methods now in use in the United States and Europe—the League of Nation's method, the U. S. P. method, Ulman's method and others. He mentioned many problems encountered in the use of the various types of warm and cold-blooded animals, and pointed out the progress he had made toward obtaining more reliable results for the standardization of digitalis preparations.

A discussion followed, after which a rising vote of thanks was extended to the speakers.

HERBERT C. KASSNER, *Secretary*.

NORTHERN OHIO.

The March meeting of the Council of the Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at Hayden Hall, March 13th. Dr. K. K. Chen, Director of Pharmacologic Research, Eli Lilly and Company, was guest at the dinner and speaker for the general meeting.

During the dinner, reports of the officers and committees were presented and accepted. The Program Committee reported that Prof. E. Fullerton Cook, Chairman of the Committee on Revision of the U. S. P. X, would address the Branch on April 11th.

After adjournment of the council the members joined the general membership in the auditorium of the Biology Building and Dr. K. K. Chen presented a paper on "Recent Studies of Ephedra and Ephedrine."

Dr. Chen gave an illustrated talk on the production of Ma Huang, and the chemistry and pharmacology of the active principles. The following are the main points discussed in his lecture:

Ma Huang was known as *Ephedra vulgaris* var. *helvetica* but has now been given a new name, *E. Sinica*. In commerce there is another Chinese species *E. equisetina*, which is also sold under the name of Ma Huang. These species present pharmacognostic characteristics that can be used for identification.

The active principle, ephedrine, can be easily identified by its physical constants and some chemical tests. There are five other alkaloids that occur in small amounts in Ma Huang.

Dr. Chen has determined a racial difference in the mydriatic action of ephedrine, powerful

in Caucasians, but very weak in the colored races.

Of six optical isomers, natural or *l*-Ephedrine is most active physiologically. None of the synthetic compounds have proven to be superior to ephedrine.

Clinically, ephedrine has been successfully used in spinal anæsthesia in combating the fall of blood pressure. In conclusion Dr. Chen stated that most of the advances in the clinical uses of ephedrine have been made during the last six years, and gave a survey of the work done on ephedra and ephedrine. He also demonstrated a chemical test to distinguish Pseudo-Ephedrine from Ephedrine.

F. J. BACON, *Secretary.*

NORTHWESTERN.

An educational meeting of the Branch was held in the auditorium of the College of Pharmacy, University of Minn., Minneapolis, on Thursday, May 1st.

President Almin called upon Dean Wulling to introduce Dean Ziefle, of the College of Pharmacy, Corvallis, Ore. Dean Ziefle spoke in glowing terms of the equipment and building of the University of Minnesota College of Pharmacy and gave due credit to Dean Wulling for his untiring work for the students and the pharmacists of the northwest.

The president then presented Dr. C. H. Rogers, who read and abstracted the thesis of Louis P. Mayrand, M.S., upon "The Use of Aluminum and Stannous Chloride in the Gutzeit Test for Arsenic." Mr. Mayrand established some very interesting facts in connection with his work. This thesis will probably be published in the near future, so details are omitted in these minutes.

C. V. NETZ, *Secretary.*

PHILADELPHIA.

The April meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science Tuesday, April 8th. The meeting was called to order by President Dunn. He outlined the character of the meetings for the year and emphasized that instead of catering to commercial pharmacy, the aim of the Branch will be to foster scientific meetings. The topics to be presented and discussed will be of a popular nature so that our meetings will be both instructive and enjoyable to all.

President Dunn explained that the program of the evening would be in two parts; the first hour to be devoted to 5-minute reports by prominent men on the relationship of pharmacy to the following: Medicine, education, hospital, manufacturing and legislation. Discussion followed each report.

The first speaker of the evening was Dr. William Duffield Robinson on the relationship of pharmacy and medicine. He brought forth a plan for the closer relationship of pharmacy with all allied sciences. He suggested establishing an organization representative of every branch concerned with medicine, pharmacy, chemistry, health and education. The name he suggested was "Forum of Medicine and Science," and the membership to consist of the officers, past and present, of all organizations. This would be a high grade of membership and capable of discussing the inter-relationship of the many sciences so intimately grouped.

Discussion by Professor Cook, Mr. McNeary, Dr. Viehoever and Mr. Vanderkleed followed. It was suggested that a dinner might be arranged when Dr. Robinson's idea would be further discussed, and possibly crystallize it into definite plans.

Dean LaWall spoke on "Pharmacy and Education." The progress in educational requirements of pharmacy over a period of years was outlined; education for pharmacists in the past and to some extent at present has been and is too practical or vocational—the brain should be trained as well as the hand. Students in the past came to the college of pharmacy because they wanted an education and now they come because they must have an education and, to properly prepare the present day students, they must be given a broad training and foundation whereby they will be fitted mentally and vocationally.

Members Cook, Lewis and Vanderkleed discussed the topic, all agreeing that a broader training is essential.

Professor Cook reported on Pharmacy and Economics. Scientific business methods are a necessity and they must embody the principles of truth and honesty. He explained the division of pharmacies into commercial and professional types as a future policy. This, he explained, could be worked out successfully in populous territory but a professional pharmacy in country territory would meet with difficulties.

Mr. Goodhart discussed the subject in relation of physician, pharmacist and the price

of prescriptions. He said that if the dispensing physicians would write prescriptions, then the volume of such business would reduce the cost of prescriptions.

Mr. Vanderkleed demonstrated a new ampul-filling apparatus which is especially adapted for accurate delivery of any amount of solution within the range of the syringe used for measuring.

"Hospital Pharmacy" was Mr. McNeary's topic. He said that the hospital pharmacy was a fertile field for demonstration of scientific and professional pharmacy, but a broader and more basic education is necessary to solve this problem. He pointed out the serious problem arising from the filling of prescriptions by hospitals for out-patients. Such service was termed unfair competition to retail druggists.

Dr. Pearson commented upon hospital prescription practice referred to by Mr. McNeary and said he was opposed to such practice.

Mr. Slothower read an interesting paper on "Hydrogen-Ion Control of Pharmaceutical Preparation." He showed how many preparations can be rendered stable by proper p_H control.

The chief speaker of the evening was Dr. Arno Viehoever of the Philadelphia College of Pharmacy and Science whose subject was "Testing Drugs with Lower Animals." First an explanation of the apparatus used in the demonstration was given by Mr. Lewis. The machine was developed in the College by John B. Lewis and built in the school by William Merkins. It makes projection of living organisms, greatly magnified, possible.

The daphnia or water flea and hydra were projected, magnified about 400 diameters, and showed the heart, intestines, eye and gland systems in action.

This machine has an optical limit at present of about 12,500 magnifications and has been used to show protoplasmic motion in the single living cell. Dr. Viehoever explained the value of such apparatus in the physiological testing and evaluation of drugs. Since the lower animals react to the same stimuli as man, we have life clearly enacted in a wide range, under normal and abnormal conditions and the actual visualization thereof. It is possible by these means to show what materials are drugs and their specific activity.

Due to the numerous interesting topics heard and discussed at this meeting, the regular business of the Branch was postponed until next meeting.

HUGO RIEVE, *Secretary.*

PITTSBURGH.

A joint meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, the Students' Branch of the School of Pharmacy of the University of Pittsburgh, and the Pittsburgh Veteran Druggists' Association, was held May 1st, at Webster Hall, Pittsburgh, Pa.

This occasion marked the fourth annual banquet and joint meeting of the aforementioned organizations. Dinner was served to about sixty-five members and guests.

The meeting was called to order by President John G. Rees, of the Pittsburgh Branch, A. PH. A., who introduced Dr. C. Leonard O'Connell under whose supervision a program had been prepared for the evening; Dr. O'Connell spoke of the organization of the Students' Branch at the School of Pharmacy and indicated that remarkable progress had been made.

President R. D. Coombs, of the Students' Branch, was introduced and took charge of the meeting. He indicated the appreciation of the Student body to the Pittsburgh Branch for their coöperation in establishing this student activity at Pitt. He then presented the speakers of the evening. The program consisted of original essays prepared by members of the Student Branch.

Robert S. Ross spoke on "The Value of Association to a Student." C. Reinsel selected as his subject "Development through Organization." D. Guist considered the "Pharmacist and Patriotism." Charles Freud presented for consideration "Progress in Pharmacy." Melvin Green spoke on "Our Debt to Pharmacy."

The subjects were well selected and prepared. The Pittsburgh Veteran Druggists' Association made two awards.

The judges, Drs. James H. Beal, J. A. Koch and P. G. Walter decided in favor of Mr. C. Reinsel, first award, and Mr. Melvin Green, second.

Dr. Beal spoke for the judges. The awards were made by C. L. O'Connell in behalf of the Pittsburgh Veteran Druggists' Association.

Charles E. DeBone was presented to the group. He was elected by the Students' Branch to attend the convention of the AMERICAN PHARMACEUTICAL ASSOCIATION, at Baltimore.

In conclusion, Dr. O'Connell presented many prominent persons in Pharmacy who indicated their enjoyment of the evening.

FRANK S. MCGINNIS, *Secretary.*

RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION AT ITS SEVENTY-EIGHTH ANNUAL MEETING AT BALTIMORE, MD., MAY 5 to 10, 1930, UPON RECOMMENDATION OF THE HOUSE OF DELEGATES, THROUGH ITS COMMITTEE ON RESOLUTIONS.

PRESIDENT DUNNING'S ADDRESS.

We desire to commend the Presidential Address of Dr. H. A. B. Dunning as an able, comprehensive and thought-provoking document. We have given his recommendations, specific as well as implied, serious consideration and the Resolutions numbered 1 to 15 are offered as the recommendations of this Committee with reference to the subjects touched upon by our President.

No. 1. Congratulations on Twenty-fifth Anniversary of the Founding of the Council on Pharmacy and Chemistry.

Resolved, that the congratulations of the AMERICAN PHARMACEUTICAL ASSOCIATION be tendered to the American Medical Association upon the twenty-fifth anniversary of the founding of the Council on Pharmacy and Chemistry, and be it further

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION expresses its appreciation of the work of W. A. Puckner, Secretary of the Council on Pharmacy and Chemistry, American Medical Association, who is at present the only pharmacist connected with the Council, and be it further

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION expresses the hope that in filling future vacancies on the Council cognizance be taken of the contribution of the late M. I. Wilbert and C. S. N. Halberg to the work of this important body and that pharmacists may again be represented in its personnel to the extent originally contemplated.

No. 2. New and Non-Official Remedies.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION commend the general excellence and usefulness of New and Non-Official Remedies published by the American Medical Association and that pharmacists everywhere be urged to place this volume upon their shelves of reference works with the U. S. P., N. F. and Recipe Book.

No. 3. Headquarters Building Contributions.

Resolved, that the thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be conveyed to the Chairman and members of the Headquarters Building Committees, to the contributors and to all others who have had a part in making the erection of the Headquarters Building in the City of Washington, a reality, and be it further

Resolved, that we urge all pharmacists who have not yet contributed in fullest measure to the success of this undertaking, to give it their further material support.

No. 4. Endowment for Headquarters.

Resolved, that the efforts put forth by the AMERICAN PHARMACEUTICAL ASSOCIATION to obtain an adequate financial endowment for the Headquarters Building, be continued and that whenever possible the service of American Pharmacy to the public be brought to the attention of public-spirited citizens and to the various Foundations for the promotion of the public health and welfare.

No. 5. Restricting Occupancy of Headquarters Building.

Resolved, that occupancy of the Headquarters Building when erected shall be restricted to organizations and institutions serving American Pharmacy on a non-profit basis.

No. 6. Thanks to the Commission of Fine Arts and Parks and Planning Commission.

Resolved, that the thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be expressed to the Commision of Fine Arts and to the Parks and Planning Commission for their valuable suggestions, aid and coöperation in developing the plans for the Headquarters Building.

No. 7. Pharmacists in Government Service.

Resolved, that the attention of the Congress of the United States, and the heads of the United States Army and Navy be again directed to the importance and necessity of providing the

personnel of the Army and Navy with the same quality of pharmaceutical service now available to civilians.

Resolved, that the administrative officers of the Army and Navy be requested to follow the lead of the United States Public Health Service in selecting pharmaceutical personnel from among the graduates in pharmacy of recognized colleges.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION again endorse H. R. 8473 and S. 3211, providing for a Pharmacy Corps in the United States Army.

Resolved, that the efforts already made to amend H. R. 6696 providing for a commissioned medical service in the Veterans Bureau so as to include pharmacists in the commissioned personnel be continued and that the AMERICAN PHARMACEUTICAL ASSOCIATION records itself most emphatically as favoring snch an amendment.

No. 8. The Parker Bill—Advisory Council in Public Health Service.

WHEREAS, the Parker Bill, recently passed by the Congress and signed by the President, provides for the formation of an Advisory Council in the United States Public Health Service, and

WHEREAS, pharmacists render a valuable service in connection with the preservation and improvement of the public health, be it

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION suggest to the proper officials of the Government, the advisability of including a representative pharmacist in the membership of the Advisory Council.

No. 9. Council of Pharmaceutical Education.

Resolved, that the work of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy in promoting higher, better and more liberal education for pharmacists be fully endorsed.

Resolved, that the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION be authorized to join with the American Association of Colleges of Pharmacy and the National Association Boards of Pharmacy in the formation of a Council on Pharmaceutical Education, if and when such action is contemplated by the two Associations named.

No. 10. Endorsement of Pharmaceutical Law Enforcement Officials.

Resolved, that we endorse the efforts of the Conference of Pharmaceutical Law Enforcement Officials in their endeavor to bring about greater uniformity in law enforcement procedure and in the collection and distribution of information on Pharmacy Laws.

No. 11. Endorsement of Conference of Pharmaceutical Association Secretaries.

Resolved, that the Conference of Pharmaceutical Association Secretaries be given continued encouragement and coöperation in their function of acting as a clearing house for matters of State Association policy and in the solution of State Association problems.

No. 12. Fair Trade Legislation.

Resolved, that we heartily endorse the Capper-Kelly Bill (H. R. 11 and S. 1418) now pending before the Congress of the United States, also known as the Fair Trade Bill, legalizing the right of any producer of identified merchandise who is in fair and open competition with other producers of similar or competing merchandise, to enter into enforceable contracts for the protection of resale prices upon his own identified merchandise, and

Be It Further Resolved, that this ASSOCIATION continue its efforts in coöperation with other pharmaceutical Associations, the American Fair Trade Assocation, as well as other industrial bodies in bringing to the attention of the Congress the need for this legislation.

No. 13. Unrelated Merchandising.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION recommend to retail pharmacists generally the advisability of considering the curtailment of merchandising along lines unrelated to the usual departments of a Pharmacy, to the end that retail merchants generally may remain or become disinclined to encroach upon the domain of the pharmacist in the sales of drugs and medicines.

No. 14. Commending Secretary Kelly and Editor Eberle.

Resolved, that the untiring efforts of Secretary E. F. Kelly and Editor E. G. Eberle in behalf of this ASSOCIATION and Pharmacy generally, be most highly commended.

No. 15. Commending Robert L. Swain, Chairman of House of Delegates.

Resolved, that Chairman Robert L. Swain, presiding officer of the House of Delegates, at this meeting, be commended for his excellent address and timely suggestion that pharmaceutical organization keep in mind the importance and the needs of the individual pharmacist and that full use be made of our present organizational facilities in the various fields of pharmacy, and

Be It Further Resolved, that Chairman Swain be commended for the fair, courteous and able manner in which he presided over the deliberations of the House of Delegates at this meeting.

No. 16. Appreciation of Visit of Representatives of Canadian Pharmacists.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its appreciation of the visit of President M. R. MacFarlane and Secretary R. B. J. Stanbury of the Canadian Pharmaceutical Association to this Convention and that the thanks of the ASSOCIATION be expressed to Mr. MacFarlane for his excellent address on "Pharmacy in Canada," and

Be It Further Resolved, that we express to the Canadian Pharmaceutical Assocation our best wishes for a successful Convention, our appreciation of the visit of their President and Secretary and our promise of a full measure of coöperation in making the Annual Meeting, to be held in conjunction with the Canadian Pharmaceutical Association in 1932 at Toronto the most outstanding international gathering of pharmacists on this continent.

No. 17. Appreciation of Visit of Dr. H. S. Wellcome.

Resolved, that we express to Dr. H. S. Wellcome our appreciation of his presence at this Convention and our thanks for his very constructive suggestions in connection with the plans for the Headquarters Building.

No. 18. Appreciation of Visit of Dr. John Uri Lloyd.

Resolved, that we convey to Dr. John Uri Lloyd, senior Past-President of the AMERICAN PHARMACEUTICAL ASSOCIATION, our deep appreciation of his visit to this convention and our profound thanks for his inspiring message to the General Session on May 7th.

No. 19. Thanking Governor Ritchie and Mayor Broening.

Resolved, that the thanks and appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION be conveyed to Governor Albert C. Ritchie of the State of Maryland and Mayor Wm. F. Broening, of the City of Baltimore, for their personal messages and greetings conveyed to this ASSOCIATION at the Annual Banquet on May 6th.

No. 20. Better Press Service.

Resolved, that the officers of the AMERICAN PHARMACEUTICAL ASSOCIATION and its various Sections, the officers of the House of Delegates and the officers of the various organizations holding their annual meetings in conjunction with the AMERICAN PHARMACEUTICAL ASSOCIATION, be requested to provide their annual addresses, reports and abstracts of important papers for distribution to the lay and technical press sufficiently in advance to permit wide dissemination of this information with greater speed and accuracy than has been possible in the past, and

Be It Further Resolved, that facilities commonly provided for the use of press representatives be made a part of the local equipment of future meetings.

No. 21. Drug Trade Bureau of Public Information.

Resolved, that the work of the Drug Trade Bureau of Public Information be commended and the financial support of the AMERICAN PHARMACEUTICAL ASSOCIATION in behalf of this activity be continued.

No. 22. Pharmacists on Board of Health.

Resolved, that State and Local Pharmaceutical Associations be urged to suggest to the proper appointing authorities the advisability of including at least one pharmacist in the personnel of State and Local Boards of Health.

No. 23. Pharmaceutical Service in Hospitals.

WHEREAS, Pharmaceutical Service to the sick in the Hospitals of the United States is an important branch of medical care and should be supervised by registered pharmacists, be it

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION urge upon the authorities in charge of hospital standardization, the advisability of placing Hospital Pharmacies under the supervision of Registered Pharmacists, and

Be It Further Resolved, that the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION be requested to assign to the proper officers or committees of this ASSOCIATION, the task of preparing a suggested set of standards of adequate pharmaceutical service, equipment and personnel for Hospitals of various grades to the end that such suggestions may be available to Hospital Organizations if, and when, requested.

No. 24. George Washington Anniversary.

Resolved, that the observance of the Two Hundredth Anniversary of the Birth of George Washington, to take place in 1932, under the auspices of the George Washington Bicentennial Commission, Washington, D. C., be endorsed and that the invitation of the Commission, as extended to the AMERICAN PHARMACEUTICAL ASSOCIATION, be accepted.

No. 25. Endorsement of Pharmacy Week.

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION again give its endorsement to the celebration of Pharmacy Week and urge its members and all other pharmacists to give this important feature their fullest support and coöperation in connection with the 6th observance, October 12–18, 1930, and

Be It Further Resolved, that the thanks of the ASSOCIATION be expressed to the General Chairman and his associates on the Joint Committee of the AMERICAN PHARMACEUTICAL ASSOCIATION and National Association of Retail Druggists on Pharmacy Week.

No. 26. Visits of A. Ph. A. Representatives to Other Associations.

Resolved, that the policy of maintaining contacts with all groups and individuals interested in pharmaceutical progress, by means of visits from the officers of the AMERICAN PHARMACEUTICAL ASSOCIATION, whenever possible, be continued.

No. 27. Lyman Spalding for Hall of Fame.

Resolved, that we again bring to the attention of those charged with the selection of names of individuals for a place in the New York University Hall of Fame, that the founder of the United States Pharmacopœia, Dr. Lyman Spalding, is, from every standpoint, entitled to this honor.

No. 28. Contact with Medical Societies.

Resolved, that we again recommend to all State and Local Pharmaceutical Associations the importance of maintaining professional contact with State and Local Medical Societies to the end that a spirit of coöperation and better understanding between the medical profession and pharmacy may be fostered and maintained.

No. 29. Acquainting Physicians with the National Formulary.

Resolved, that Pharmacists throughout the United States be urged to continue in their efforts to acquaint practicing physicians with the object, legal status and contents of the National Formulary to the end that full use may be made of this important work in prescribing remedies that may be indicated in the treatment of disease.

No. 30. Use of Words "Pharmacist" and "Drug."

Resolved, that a special effort be made to bring to the attention of the newspapers of the United States the distinction between the terms "Pharmacist" and "Druggist" and that the publicity committees of all National, State and Local pharmaceutical Associations be requested to urge newspapers to use the term "pharmacist" in referring to members of the pharmaceutical profession, and

Be It Further Resolved, that similar efforts be made to bring about the use of the words "narcotic" or "narcotic drug" in place of the designation "drug" when narcotics are referred to in the news of the day.

No. 31. Thanks to Local Secretary Harris and Others.

Resolved, that the hearty thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be conveyed to Local Secretary Samuel Y. Harris and the members of his Committee, to the Baltimore Retail Druggists Association, the Maryland Pharmaceutical Assocation, the Travelers Auxiliary of the Maryland Pharmaceutical Association, the Baltimore Association of Commerce, the Baltimore Sun, The Police Department of the City of Baltimore, as well as to the management of the Hotel Emerson and the Lord Baltimore Hotel for their splendid hospitality as displayed in so many ways throughout this Convention week.

No. 32. Copies of Resolutions to Other Associations.

Resolved, that copies of all resolutions passed at this Seventy-Eighth Annual Meeting be supplied to the National Association of Retail Druggists, to State Pharmaceutical Associations and to all other National and Local Pharmaceutical and Medical Associations and individuals that may be interested, with the request that they take note of and, where advisable, endorse these resolutions in so far as they pertain to matters of general pharmaceutic interest and policy, not inconsistent with the aims and objects of the respective associations.

No. 33. Commending Surveys of Departments of Commerce.

Resolved, that the work of the United States Department of Commerce in making surveys of methods of distribution, be commended.

No. 34. Enlarging Publicity Activities.

Resolved, that the committee on Coöperative Publicity be enlarged to include 3 members from each District, one to represent the Colleges of Pharmacy, one to represent Boards of Pharmacy, and one to represent State Pharmaceutical Associations, and that this Committee be requested to present a plan at the 1931 Convention for financing pharmaceutical publicity on a national scale.

No. 35. Objectionable Advertising.

Resolved, that the use of the phrase "Recommended by all Reliable Druggists" and all similar phrases, as used by advertisers of certain Patent Medicines, is obnoxious and misleading, and that steps be taken to convey to such advertisers our objections to a continuance of this unwarranted practice.

ABSTRACTS OF PAPERS READ BEFORE THE SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

SCIENTIFIC SECTION.

The Deportment of Camphor, Monobromated in Reference to Compressed Medicinal Tablets, Geo. E. Ewe.—Evidence is offered to establish Camphor, Monobromated as a definitely volatile substance, and some of the effects of this volatility upon tablets containing this substance and upon the manufacture of these tablets are noted.

The Market Quality of Pharmaceutical Raw Materials, Geo. E. Ewe.—Results of chemical examination of deficient and variable pharmaceutical raw materials are given and an attempt is made to indicate the degree of quality of the materials being offered in the market.

Comments Pertinent to the Coming Revisions of the "U. S. P." and "N. F.," Geo. E. Ewe.—Certain comments and criticisms of the present "U. S. P." and "N. F." are presented for consideration by the incoming Revision Committees.

The Analysis of Ethylene-Diamine-Theophyllin, Philip W. Schmitt.—The literature shows no detailed description of a method for the analysis of ethylene-diamine-theophyllin. The author has developed a method which gives directly the theophyllin content, and indirectly the ethylene-diamine content. The method is fairly simple and requires no elaborate apparatus. The sources of error and the advantages of the method are briefly discussed. A plea is also made

for the adoption of the word "Aminophyllin" as a synonym for ethylene-diamine-theophyllin and euphyllin.

The U. S. P. Strophanthus Standard, L. W. Rowe.—Experimental evidence is submitted to show that the present U. S. P. standard for Strophanthus is rather high and that a revision downward is desirable. A reduction of 25% is suggested. Objections to the One-Hour Frog Method are given and a Six-Hour M. L. D. Frog Method is suggested for the next U. S. P.

The Phytochemical Study of Hydrastis, H. A. Langenhan and Ewin Gillis.—This is a study of the alkaloidal content, ash, moisture, ratio of rhizone to root, variations due to months, years, seasons, etc. Somewhat along the lines of the Portland paper but representing three years' work and much more in detail.

The Preparation of 3-Carbamido-4-hydroxyphenylarsonic Acid, W. G. Christiansen and A. E. Jurist.—The preparation of 3-Carbamido-4-hydroxyphenylarsonic acid is described and its toxicity is compared to that of Stovarsol. It was found to be about twice as toxic as Stovarsol.

Studies on Alkali Bismuth Tartrates from the Chemical and Biological Standpoint, A. E. Jurist and W. G. Christiansen.—The results of an extensive series of experiments on the biological characteristics of alkali bismuth tartrates are given. Various media were used to prepare solutions of these compounds and they are compared from the standpoint of stability, absorption, local reactions at the site of injection, toxicity, and p_H. Included in these tests is a colloidal bismuth tartrate solution in hydrolyzed gelatin. The results show very strikingly the irritating character of alkali bismuth tartrates in aqueous solution when injected intramuscularly.

A Comparison of the p_H of Neoarsphenamine and Sulpharsphenamine in Relation to Differences in Their Structure, A. E. Jurist and W. G. Christiansen.—The p_H units higher than that of sulpharsphenamine which has a p_H range of 2.2, to 4.5. It has been found that sulpharsphenamine is unstable at p_H 5.0 or above whereas neoarsphenamine is unstable at as low a p_H as 5.0 or below. These facts being incompatible with the supposedly slight difference in the structure of these two substances a new structure is advanced for sulpharsphenamine which could account for this difference. The work of Newberry would tend to confirm this.

The Pharmacology and Pharmacognosy of the Cactaceæ. I. The Action of Certain Species upon the Heart, James C. Munch and H. H. Crosbie.—The literature contains many conflicting statements regarding the clinical value of various members of the cactus family in the treatment of heart diseases. Pharmacological investigations upon identified species are reported.

The Pharmacology and Pharmacognosy of the Cactaceæ. II. The action of Certain Species upon the Central Nervous System, James C. Munch and H. H. Crosbie.—The action of fluidextracts of identified members of the cactus family has been determined upon dogs by the method official in U. S. P. X, for the bio-assay of cannabis. Of the species tested so far, only Anhalonium Lewinii has been found to be physiologically active.

Examination of the Fatty Oil of Echinacea. S. H. Culter and Edward Kremers.—The volatile oil of this drug is under examination by E. L. Woods of the University of Saskatchewan. The fatty oil has been examined by Heyl and Hart, of Kalamazoo, Mich. Possibly the principal interest in the oil resides in the sitosterol isolated therefrom. Whereas Hey and co-workers obtained a mixture of sterols, the identity of any one of which was left doubtful, the sterol isolated from the alcoholic extract, kindly prepared in the laboratory of Lloyd Brothers, Cincinnati, O., was a chemical unit, namely, sitosterol. Radiation and feeding experiments of this product are being made in the laboratory of Prof. Steenbock of the Department of Agricultural Chemistry.

Emulsions, C. O. Lee and Edward Kremers.—To read the chapter on Emulsions in a pharmaceutical text, written not many years ago, and then to glance at a modern physico-chemical journal article on the same subject, causes one to realize that a new language must be mastered before the latter may be comprehended. Empiricism is giving way to modern science. Yet that phase of science which finds expression in this modern study appears rather narrow and one sided. Structural considerations of the emulsified material seem to have received little if any consideration whatever. Nevertheless the latter viewpoint must be considered fundamental. A mere beginning in this direction has been attempted. If modern viewpoints throw new light on an old pharmaceutical subject, the same pharmaceutical texts alluded to appear to have been as indifferent to the history of this venerable class of galenicals as to their modern scientific study.

A Potentiometric Assay of Cinchona Bark, John C. Krantz, Jr.—A method of assaying cinchona bark which makes unnecessary the shaking out process. The method is potentiometric.

Certain Aspects of Carbohydrate Metabolism, John C. Krantz, Jr.—The study of the metabolism of certain substitutes for starch in the diets of normal and diabetic patients.

The Estimation of Poisons in the Presence of Preservatives, L. W. Rising and E. V. Lynn.—The paper takes up the history of toxicology, the reasons for such an investigation, and the method followed in the work. The second part is the actual investigations carried out on alcohol, chloroform, phosphorus, mercury, lead, chloral hydrate, oxalic acid, iodine, cocaine, morphine, phenol, barbital and cyanides. Graphs are included showing the results of the quantitative determinations.

The Stabilization of Solution of Arsenous and Mercuric Iodide, U. S. P. X., William J. Husa and W. W. F. Enz.—Donovan's Solution stabilized in various ways was stored in amber-colored bottles in diffused light, samples being withdrawn occasionally for analysis. After 10 months, the % deterioration was as follows: modified formula proposed by authors, less than 1%; control, 12.4%; neutralized with KOH, 10.1%; saturated with CO_2, 8.7%; neutralized with KOH and saturated with CO_2, 6.1%; air replaced by H_2, 12.5%; neutralized with KOH and air replaced by H_2, 7.3%; $CaCO_3$ added, 6.0%; terpin hydrate added, 8.3%.

The Effect of Stabilizers in Lard in Relation to Its Use in Ointment of Potassium Iodide, N. F. V, William J. Husa.—Hydroquinone is unsuitable for use as a stabilizer in Ointment of Potassium Iodide on account of the color developed, which varies from gray to brown. The effect of benzoin was determined by the rate of liberation of iodine in ointments in which $Na_2S_2O_3$ was omitted. In ointments stored in glass containers in diffused light at room temperature, benzoin reduces the rate of liberation of free iodine; it also reduces the rate of absorption of iodine by the unsaturated glycerides of the lard. Observations were also made under other conditions of storage.

The Hydrolysis of Arsenous Iodide, William J. Husa.—The U. S. P. states that freshly prepared aqueous solutions of arsenous iodide upon standing gradually decompose with the formation of arsenous and hydriodic acids. Experimental evidence indicates that the salt hydrolyzes almost completely immediately after being dissolved in water. Definite suggestions are presented as to desirable changes in the U. S. P. monograph.

The Conversion of Quinine and Other Cinchona Alkaloids into Their Toxine and the Question as to the Toxicity of Quinine, Herny C. Biddle.—Quinine and the cinchona alkaloids in general under certain conditions, as are known, are converted into toxic substances. This conversion in any case consists of a molecular rearrangement and is closely dependent upon the concentration of the univalent alkaloidal ion. Quinine may yield traces of its toxine in the stomach under condition of deficiency of hydrochloric acid and in the presence of an organic acid such as lactic, citric or acetic. Mixtures of quinine with medicinals such as antifebrin (acetanilid), or phenacetin (acetphenetidin), which under favorable conditions may yield small amounts of free acetic acid by hydrolysis, may on standing become unfit for use through the partial conversion of the quinine into quinotoxine and resinous products.

The Quality of Tincture of Aconite, H. B. Haag and L. W. Hawkins.—Specimens of Tincture of Aconite prepared by the more prominent pharmaceutical houses and purchased on the open market were examined as to potency and hydrogen-ion concentration. The results obtained were compared to a similar study made in this laboratory about fifteen years ago, when the preparation was chemically assayed. Results indicate that although the bio-assay method is now employed the quality of Tincture of Aconite now available is probably not superior to that of fifteen years ago.

The Variability of Pharmaceutical Preparations (Preliminary Report), H. B. Haag and L. E. Jarrett.—Assays were made of specimens of the more popular prescription preparations obtained from various pharmacies in Virginia. Results indicate wide variations in some instances, even in such easily standardized preparations as Dilute Hydrochloric Acid.

Studies on the Toxicity, Absorption and Elimination of Nupercain, W. R. Bond and N. Bloom.—This new local anesthetic, introduced by the Society of Chemical Industry, Basle, Switzerland, is claimed to be superior to cocaine for mucous membrane anesthesia. It is five times more toxic but can be used in one-tenth the concentration for cocaine anesthesia. Its greatest efficiency is exerted on the cornea. Studies in this laboratory reveal that the M. L. D. of Nupercain for dogs is about three mg. per kilo when given by vein. Its subcutaneous M. L. D. for the guinea-pig is about twenty-six mg. per kilo. Ten mg. per kilo applied to the nasal mucosa

is fatal in a few minutes. Contrary to Uhlmann the compound is very rapidly detoxicated in vivo.

A Progress Report on the Estimation of Ethyl Nitrite in Copaiba Mixture, N. F., W. G. Crockett, W. M. Frayser and G. V. Thompson.—We have found that the estimation of ethyl nitrite in copaiba mixture by the U. S. P. nitrometer method is unsatisfactory. Results are far too low. If the ethyl nitrite is first introduced into the nitrometer and followed by copaiba mixture which contains no ethyl nitrite, results are higher but are still about 70% of the theoretical yield. Work is now in progress which we hope will show the reason for this discrepancy.

Further Studies on the Salvarsans and Related Compounds, C. N. Myers.—A chemical consideration of the organic arsenicals which are successfully used in medicine. From which it appears important that more careful preparation of products is an important feature in regard to the clinical use of the arsenicals.

Plant Breeding Experiments with the Genus Aconitum, Plates 12–15, Wm. J. Bonisteel.—Methods used in plant breeding. Clonal plants for propagation of desirable strains. Breeding is a method of standardization. Cultivated plants *versus* wild plants. Rapid seed germination. Flower and pollen tube behavior. Dichogamy and related phenomena.

The Inorganic Constituents of the Acid-Soluble Portion of the Ash of Official and Non-official Vegetable Drugs, E. L. Newcomb and E. B. Fischer.—A report on the qualitative analysis of the soluble portion of the ash of nearly 400 official and non-official vegetable drugs. Carefully cleaned samples of the drugs from plants grown in the Medicinal Plant Gardens of the College of Pharmacy, University of Minnesota or from commercial sources were subjected to incineration as prescribed in the U. S. P. for the determination of total ash. Qualitative tests were made for the following radicals or elements: S, CO_3 NO_3, B, SO_4, PO_4, Cl, I, Br, Cu, Pb, Sn, Al, Fe, Cr, Co, Ni, Mn, Zn, Ca, Ba, Sr, Mg, Na and K. The tests made show the almost invariable presence of chlorides, sulphates, phosphates, aluminum, iron, calcium, magnesium, sodium and potassium. In 356 of the 392 samples tested, positive tests for carbonates were obtained; 308 samples gave distinct tests for manganese, and in 20 cases sulphur was found to be present in the form of the sulphide as well as in that of the sulphate. Nitrates were particularly conspicuous by their absence. Even in the solanaceous drugs, in which the nitrate content is said to be high, nitrates could not be detected. Copper and Boron, which have been reported in very minute amounts in plants, could not be detected by ordinary tests. Iodides and Bromides, particularly in the algal drugs, were found absent. This is possibly due to the fact that the temperature of incineration is not sufficiently controlled to prevent loss of certain elements by volatilization. The chief difference to be noted in the various ashes is in the manganese and sulphur as sulphide content and that the other elements vary quantitatively rather than qualitatively in the inorganic residue.

U. S. P. Biological Assay of Cod Liver Oil Present and Future, John F. Anderson.—Steps leading to the present optional U. S. P. method for the biological Vitamin A assay of Cod Liver Oil are discussed. Certain limitations of the present method are referred to and modifications suggested, with particular reference to the inclusion of a method for the assay of Vitamin D content of Cod Liver Oil. Importance of standard methods for Vitamin A and D assay of Cod Liver Oil and form of label statement are pointed out.

Oils from the Leaves of Washington Conifers, Arnold J. Lehman and E. V. Lynn.—The forests of Washington contain a very small variety of coniferous trees compared to the total number of species which have been described. Of the 470 or more listed in the literature, only about twenty are found in the state, but they occur to a very large extent. Oils from the leaves of eight of these have already been prepared, four of them having been more or less completely examined. It seems desirable to distil some of the other oils and study them.

A review of the literature on the investigations which have been recorded is here submitted, as preliminary to other papers covering oils hitherto unprepared. The list of twenty-one Washington conifers is given and a bibliography of work on leaf-oils from eight of them: *Juniperus communis; Chamaecyparis nootkatensis; Thuja plicata Pinus ponderosa; P. contorta; Pseudot suga mucronata; Tsuga heterophylla; Picea englemanni.*

The Leaf Oil of Pinus Monticola, Arnold J. Lehman and E. V. Lynn.—The western white pine, *Pinus monticola,* is a large tree which is usually indigenous to mountainous regions. The material for this paper was, however, gathered near sea level.

The oil, obtained by steam distillation of the leaves in a yield of 0.5 per cent, was colorless and possessed a pleasant, balsamic odor; d_{25} 0.8695; $(\alpha)_D$ —1731°; N_D 1.4724; acid number 4.25; saponification value 26.78.

After removing the acids and phenols by successive extraction with sodium carbonate and sodium hydroxide, the residual oil was fractionated repeatedly. The terpenes, which amounted to nearly 80 per cent of the total oil, were chiefly beta-pinene and alpha-pinene, with smaller amounts of beta-phellandrene and possibly camphene, but no limonene or dipentene was present. The oil boiling above 190° C. was first saponified and then submitted to fractional distillation. Borneol, fairly large quantities of an unidentified lactone, and a blue oil were found. Butyric and valeric acids were probably constituents of the saponification alkali.

LIST OF THE REGISTRANTS, ANNUAL MEETING, A. PH. A., BALTIMORE, MARYLAND.

List of Registrants in attendance at the Seventy-Eighth Annual Meeting, A. PH. A.—Corrections and additions respectfully requested; please address JOUR. A. PH. A., 10 W. Chase St., Baltimore, Md.

ACHESON, MR. AND MRS. WM. R., Cambridge, Mass.
ADAMS, MR. AND MRS. WALTER D., Forney, Texas.
ALACAN, JOSÉ P., Habana, Cuba.
ALLAN, MR. AND MRS. C. F., Wyandotte, Mich.
ALLEN, ADOLPH, Baltimore, Md.
ALLEN, H. W., AND FAMILY, Baltimore, Md.
ALLEN, JAMES H., Waterville, Me.
ANDERSON, C. M., MR. AND MRS., Oklahoma City, Okla.
ANDERSON, WM. C., Brooklyn, N. Y.
ANDREWS, M. J., MR. AND MRS., Baltimore, Md.
ANSTINE, C. L., MR. AND MRS., Baltimore, Md.
ARMSTRONG, CHARLES L., MR. AND MRS., Baltimore, Md.
ARMSTRONG, THOMAS B., Bethesda, Md.
ARNOLD, H. C. F., MR. AND MRS., Floral Park, N. Y.
ARNY, H. V., New York City.
AVERY, CHARLES H., Altadena, Calif.
AYD, MR. AND MRS. GEORGE J., Baltimore, Md.

BACON, EPHRAIM, MR. AND MRS., Baltimore, Md.
BACON, FRANKLIN J., Cleveland, Ohio.
BACON, DOROTHY, Cleveland, Ohio.
BAKETEL, H. SHERIDAN, Jersey City, N. J.
BALLEW, J. GORDON, Lenoir, N. Car.
BARBELLA, NICHOLAS GEORGE, Washington, D. C.
BARNETT, W. D., Baltimore, Md.
BARROLL, W. L., Baltimore, Md.
BAUER, JOHN C., MR. AND MRS., Baltimore, Md.
BAUMGARTNER, MR. AND MRS., Baltimore, Md.
BEAL, GEORGE D., Pittsburgh, Pa.
BEAL, JAMES H., MR. AND MRS., Camp Walton, Fla.
BEAR, P. C., Baltimore, Md.
BEARD, JOHN G., Chapel Hill, N. C.
BECKER, H. C., Baltimore, Md.
BECKER, IRWIN A., Chicago, Ill.
BEHREND, S. M., Baltimore, Md.
BENFIELD, HERBERT E., Cleveland, Ohio.
BENSON, EVELYN H., Baltimore, Md.
BERG, FRANTZ F., Floral Park, N. Y.
BERGY, GORDON, Morgantown, W. Va.
BERNER, MARY RAABE, Ada, Ohio.
BIALK, BERNARD A., Detroit, Mich.
BIBBINS, MR. AND MRS. FRANCIS E., Indianapolis, Ind.
BIBBINS, RUTH, Indianapolis, Ind.
BIDDLE, HENRY C., MR. AND MRS., San Francisco, Calif.
BINGHAM, WILLIAM E., Tuscaloosa, Ala.
BIRELY, R. M., MR. AND MRS., Baltimore, Md.
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BLACK, JAMES A., Baltimore, Md.
BLANEY, CHARLES M., MR. AND MRS., Baltimore, Md.
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BLOME, MR. AND MRS. WILLIAM HENRY, Detroit, Mich.
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BLOSS, J. H., Baltimore, Md.
BLUMBERG, MRS. RAE, Baltimore, Md.
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BROWN, WM. E., Baltimore, Md.
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BYE, MORTIMER, MR. AND MRS., Cincinnati, Ohio.

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CANIS, O. P. M., Long Island, N. Y.
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COOPER, ZADA M., Iowa City, Iowa.
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JOSEPH, ERWIN M., Austin, Texas.
JUDISCH, GEORGE, Ames, Iowa.
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KANTROWITZ, HUGO, New York City.
KARMANN, GEORGE, Baltimore, Md.
KEBLER, LYMAN F., MR. AND MRS., Washington, D. C.
KELLY, E. F., MR. AND MRS., Texas, Md.
KELLY, SCOTT, Gaston, Ind.
KEMP, ERVIN F., Washington, D. C.
KEPPLER, MILTON J., Baltimore, Md.
KING, CHARLES WILLIAM, Chicopee Falls, Mass.
KING, F. H., Delphos, Ohio.
KING, GEORGE H., Baltimore, Md.
KING, STANDISH BOARDMAN, Chicopee Falls, Mass.
KINNAMON, HARRY A., MR. AND MRS., Baltimore, Md.
KINNEAR, MR., Mt. Ranier, Md.
KINSEY, RAYMOND D., Perry Point, Md.
KIRSCHNER, DAVID, Baltimore, Md.
KLINGEL, C. H., Baltimore, Md.
KLINGEL, E. M., Baltimore, Md.
KNIGHT, CHARLES H., MR. AND MRS., Baltimore, Md.
KOCH, J. A., MR. AND MRS., Pittsburgh, Pa.
KOETZ, J. L., Pittsburgh, Pa.
KRANTZ, J. C., MR. AND MRS., Baltimore, Md.
KREMENS, ABRAHAM I., Philadelphia, Pa.
KREMERS, EDWARD, Madison, Wis.
KRUMWIEDE, HOWARD A., MR. AND MRS., Highland Park, N. J.

LAKEY, ROLAND T., Detroit, Mich.
LAMBRECHT, F. A., MR. AND MRS., Baltimore, Md.
LAPOURAILLE, ALFRED, Baltimore, Md.
LAPURAILLE, C. HOWARD, Baltimore, Md.
LANGENHAN, HENRY A., Seattle, Wash.
LANWERMEYER, CHARLES, Waukegan, Ill.
LASCOFF, J. LEON, New York City.
LAUER, WM. G. AND FAMILY, Baltimore, Md.
LAWALL, CHARLES H., MR. AND MRS., Philadelphia, Pa.
LEATHERMAN, A. J., MR. AND MRS., Baltimore, Md.
LEE, GEORGE F., Johnstown, Pa.
LEGENDRE, MARION, New Orleans, La.
LEHMAN, ROBERT S., MR. AND MRS., Brooklyn, N. Y.
LEHR, C. J. Baltimore, Md.
LEIGH, TOWNES RANDOLPH, MR. AND MRS., Gainesville, Fla.
LEMLER, A. A., Baltimore, Md.
LEMLER, HARRY, Baltimore, Md.
LEMON, ASA B., Buffalo, N. Y.
LEONARD, CLIFFORD S., Tuckahoe, N. Y.
LEROU, HERBERT M., MR. AND MRS., Norwich, Conn.
LEVIN, MORRIS, Baltimore, Md.
LEVY, ABRAHAM M., Baltimore, Md.
LITTLE, ERNEST, Newark, N. J.
LLOYD, JOHN T., Cincinnati, Ohio.
LLOYD, JOHN URI, Cincinnati, Ohio.
LOFGREN, F. V., MR. AND MRS., Valparaiso, Ind.
LORDEN, SUE A., Baltimore, Md.
LOTHOWIUM, L. B., MR. AND MRS., Baltimore, Md.
LOVE, K. F., MR. AND MRS., Baltimore, Md.
LOVE, DOROTHY, Baltimore, Md.
LOWRY, WILLIAM JOHN, MR. AND MRS., Baltimore, Md.
LUDWIG, ANDREW F., Baltimore, Md.
LYMAN, MR. AND MRS. R. A. AND SON, Lincoln, Neb.
LYON, A. G., Havre de Grace, Md.
LYON, R. MURRAY, Baltimore, Md.
LYTLE, EDWARD C., Baltimore, Md.

MCBLAIN, JOSEPH L., Baltimore, Md.
MCCLOSKY, WILLIAM T., Washington, D. C.
MCCORMICK, CHARLES E., Baltimore, Md.
MCGINITY, JOHN J., Baltimore, Md.
MCKENNA, WM. C., MR. AND MRS., Baltimore, Md.
MCKINNY, ROBERT S., Taneytown, Md.
MCNALLY, HUGH B., Baltimore, Md.
MCSHANE, OWEN W., Poultney, Vt.
MACFARLANE, M. R., Almonte, Ontario.
MACHT, D. I., Baltimore, Md.
MAGINNIS, M. B., Baltimore, Md.
MAINES, EUGENE L., Cleveland, Ohio.
MANCHESTER, C. C., MR. AND MRS., Baltimore, Md.
MANCHEY, L. L., Baltimore, Md.
MARSLAND, JOHN W., MR. AND MRS., New Britain, Conn.
MATHER, GEORGE W., Scotia, N. Y.
MAYES, HERBERT R., New York City.
MEISSNER, F. W., MR. AND MRS., LaPorte, Ind.
MEAD, MR., Baltimore, Md.
MEDILL, F. G., Baltimore, Md.
MERLE, ANDREW W., Baltimore, Md.
MERRELL, CHARLES G., MR. AND MRS., Cincinnati, Ohio.
MERRILL, EDMOND LOVIS, New Orleans, La.
MERRILL, EDMUND S., New Orleans, La.
MEYER, CATHERINE, Detroit, Mich.
MEYER, CHARLES L., Baltimore, Md.
MEYER, EDWARD J., MR. AND MRS., Detroit, Mich.
MEYER, MARIANA, Baltimore, Md.
MIDDLEKAUFF, H. P., Baltimore, Md.
MIKKELSEN, NIELS, MR. AND MRS., Kenesau, Neb.
MILLARD, D. R., Baltimore, Md.
MILLER, L. DUDLEY, Baltimore, Md.
MILNE, FRANK A., MR. AND MRS., Pratt, Kans.
MINEHART, JOHN R., Philadelphia, Pa.
MIXSON, MILES E., Baltimore, Md.
MONELL, LEON MASON, Buffalo, N. Y.
MONTANERO, LOUIS, New Haven, Conn.
MORGAN, CHARLES, MR. AND MRS., Baltimore, Md.
MORRELL, CLARENCE A., Ottawa, Canada.
MORRIS, JULIAN MR. AND MRS., Baltimore, Md.
MORRISON, R. G., MR. AND MRS., Baltimore, Md.
MOSSOP, CARRIE G., Baltimore, Md.
MOTLEY, EMERY TYLER, MR. AND MRS. Columbia, S. C.
MULDOON, HUGH C., Pittsburgh, Pa.
MULFORD, H. K., Philadelphia, Pa.
MUNCH, JAMES C., MR. AND MRS., Baltimore, Md.
MURDOCH, L. EDWARD, MR. AND MRS., Baltimore, Md.
MURPHY, JEROME, Baltimore, Md.
MURRAY, B. L., MR. AND MRS., Rahway, N. J.
MURRAY, J. EDWARD, MR. AND MRS., Ruxton, Md.
MURRAY, JOSEPH P., MR. AND MRS., Colorado Springs, Colo.
MURRAY, MARTIN, Colorado Springs, Colo.
MUTH, CHARLES, MR. AND MRS., AND DAUGHTER, Baltimore, Md.
MUTH, E. S., MR. AND MRS., Baltimore, Md.
MUTH, JOHN C., Baltimore, Md.

NEAL, C. C., Baltimore, Md.
NELSON, A. T., Baltimore, Md.
NELSON, CARL E., MR. AND MRS., Hammond, Ind.
NEUMANN, NASE, Baltimore, Md.
NEWCOMB, E. L., New York City.
NEWTON, H. C., Omaha, Neb.
NICOLAI, NATHANIEL, New York City.
NICHOLS, ADLEY B., Philadelphia, Pa.
NICHOLS, C. V., MR. AND MRS., Anadarko, Okla.
NICHOLS, J. J., New York City.
NISH, FREDERICK WM., San Francisco, Calif.
NITARDY, F. W., MR. AND MRS., Brooklyn, N. Y.
NOH, JOSEPH G., Omaha, Neb.
NOLAN, TOM, MR. AND MRS., Baltimore, Md.
NOLAND, CHARLES E., Baltimore, Md.
NOLL, FRANK M., MR. AND MRS., Baltimore, Md.
NOPPENBERGER, MARTIN J., Baltimore, Md.
NORTON, A. C., MRS., Baltimore, Md.
NORWITZ, ALBERT, Baltimore, Md.

O'CONNELL, C. LEONARD, Pittsburgh, Pa.
OFFENBACHER, T. R., MR. AND MRS., Washington, D. C.
OLIVER, HARRY K., Baltimore, Md.
OLSEN, PAUL C., Philadelphia, Pa.
OSTERLUND, O. W., Philadelphia, Pa.
OTT, C. R., New York, N. Y.
OWENS, R. M., Baltimore, Md.

PACKARD, C. HERBERT, MR. AND MRS., Winthrop, Mass.
PAINE, J. N., Baltimore, Md.
PAPPE, THEODORE F., Baltimore, Md.
PARKER, NORMAN D., Baltimore, Md.
PARKHURST, W. C., MR. AND MRS., Baltimore, Md.
PARR, ERNEST J., MR. AND MRS., Big Rapids, Mich.
PAYANT, JAMES E., MR. AND MRS., Baltimore, Md.
PEARRE, A. L., Baltimore, Md.
PEARSON, PAUL, Washington, D. C.
PEGG, GEORGE W., MR. AND MRS., East Orange, N. J.
PENSEL, WM. H., MR. AND MRS., Baltimore, Md.
PERRY, B. C. Bethesda, Md.
PETERS, E. E., Baltimore, Md.
PETTS, GEORGE EDWARD, JR., Baltimore, Md.
PFEIFER, EDWARD, MR. AND MRS., Baltimore, Md.
PHEFELDER, I. M., Baltimore, Md.
PHELPS, ARTHUR LEE, Phoenix, Ariz.
PHELPS, ISABELLE MASON, Phoeniz, Ariz.
PHILIP, W. BRUCE, San Francisco, Calif.
PHILLIPS, HOWARD, MRS., Baltimore, Md.
PIERCE, CHARLES SPRAGUE, MR. AND MRS., Springvale, Me.
PIERCE, LENA P., Springvale, Me.
PIERCE, W. L., MR. AND MRS., Baltimore, Md.
PIERCY, C. G., Baltimore, Md.
PIERPONT, MR., Baltimore, Md.

PILCHARD, J. B., Harrisburg, Pa.
PITTENGER, PAUL S., MR. AND MRS., Baltimore, Md.
PLITT, CHARLES, MR., AND MRS., Baltimore, Md.
PONDER, MR., Baltimore, Md.
POWERS, EDWARD, MR. AND MRS., Baltimore, Md.
PRINSCHAL, A. Z., Baltimore, Md.
PURDUM, F. C., Baltimore, Md.

QUANDT, MR., Baltimore, Md.

RAABE, RUDOLPH HENRY, MR. AND MRS., Ada, Ohio.
RAGLAND, THOMAS ELLSWORTH, Baltimore, Md.
RAINES, HORACE, MR. AND MRS., Baltimore, Md.
READ, W. S., MR. AND MRS., Baltimore, Md.
REED, CHAS. E., MR. AND MRS., Winchester, Ind.
REESE, ROY C., MR. AND MRS., Topeka, Kans.
REINDOLLAR, W. F., MR. AND MRS., Baltimore, Md.
RENNEBOHM, OSCAR, Madison, Wis.
RENNEBOHM, MARY, Madison, Wis.
REQUARDT, EDWARD, Baltimore, Md.
RETTALIATA, P. C., Baltimore, Md.
REZEK, GEORGE J., Baltimore, Md.
RICHARDSON, J. EDWARD, Detroit, Mich.
RICHARDSON, CHARLOTTE M., Detroit, Mich.
RICHARDSON, LLOYD N., Bel Air, Md.
RICHTMANN, WILLIAM OSCAR, Madison, Wis.
RIGGS, N. PAUL, MR. AND MRS., Washington, D. C.
RILEY, ROY M., Wichita, Kans.
RILEY, MRS. SADIE MARIE, Wichita, Kans.
RIPPETOE, JOHN ROSS, New York, N. Y.
RIVARD, W. HENRY, Providence, R. I.
ROACH, THOS., MR. AND MRS., Oklahoma City, Okla.
ROBERTS, B. E., Baltimore, Md.
ROBERTS, W. P., Baltimore, Md.
ROBINSON, H. H., Baltimore. Md.
RODDIS, LOUIS H., Washington, D. C.
RODMAN, ROBERT WILLIAM, New York, N. Y.
ROGERS, CHARLES HERBERT, Minneapolis, Minn.
ROLLER, EMIL, New York, N. Y.
ROSE, IRA WINFIELD, Rocky Mount, N. C.
ROSIN, JOSEPH, Philadelphia, Pa.
ROSSBERG, CHAS. JR., MR. AND MRS., Baltimore, Md.
ROTHROCK, R. B., Evansville, Ind.
ROUTZAHN, CHARLES, MR. AND MRS., Mt. Airy, Md.
ROWE, LEWIS W., Detroit, Mich.
RUDD, WORTLEY FULLER, Richmond, Va.
RUDY, H. R., MR. AND MRS., Hagerstown, Md.
RUPPERT, JOS. A., Baltimore, Md.
RUSBY, H. H., New York, N. Y.
RUSSELL, G. A., Greensboro, N. C.
RUSSELL, JASON LOREN, Detroit, Mich.
RUTH, ROBERT J., MR. AND MRS., New York, N. Y.

SAALBACH, LOUIS, MR. AND MRS., Pittsburgh, Pa.
SCHACTERLE, GEORGE KYLE, Philadelphia, Pa.
SCHAEFER, F. C. A., MR. AND MRS., Brooklyn, N. Y.
SCHAEFER, HUGO H., New York, N. Y.
SCHICKS, GEORGE CHAS., Montclair, N. J.
SCHINDEL, David P., Hagerstown, Md.
SCHINDEL, H. B., JR., Hagerstown, Md.
SCHLICHTING, A. F., St. Louis, Mo.
SCHMIDT, CHAS., JR., MR. AND MRS., Baltimore, Md.
SCHMITT, PHILIP, Chicago, Ill.
SCHMITT, PHILIP WILLIAM, Little Rock, Ark.
SCHNEIDER, JOHN W., Baltimore, Md.
SCHOETZOW, RAY E., Brooklyn, N. Y.
SCHRAM, W. H., Hillsboro, N. Dak.
SCHUCALTER, HARRY B., Baltimore, Md.
SCHULMAN, EMANUEL V., Baltimore, Md.
SCHULTE, C. J. A., MR. AND MRS., Baltimore. Md.
SCHULTE, T., Baltimore, Md.
SCHUMANN, OTTO J., Baltimore, Md.
SCHUMANN, WILDA MAY, Baltimore, Md.
SCOTT, EDGAR BURROUGHS, Washington, D. C.
SCOTT, VIRGINIA PATRICIA, Annapolis, Md.
SCOVILLE, WILBUR L., MR. AND MRS., Detroit, Mich.
SEARLES, ROBT. M., Philadelphia, Pa.
SELDEN, ISIDORE, Baltimore, Md.
SENCINDIVER, JUDSON HOLMES, Brooklyn, N. Y.,
SERLES, EARL P., Brookings, S. Dak.
SEXTON, MRS., Baltimore, Md.
SHAW, J. MARVIN, MR. AND MRS.
SHAY, ARTHUR, MR. AND MRS., Baltimore, Md.
SHELL, J. L., Aberdeen, Miss.
SHENKO, MORRIS, Baltimore, Md.
SHEPPARD, A. D., Baltimore, Md.
SHERER, M. V., MR. AND MRS., Baltimore, Md.
SHIVERS, MILDRED LOUIS, Baltimore, Md.
SIMON, JOHN FELICIEN, New Orleans, La.
SIPPLE, WM. F., Baltimore, Md.
SLOCUM, J. W., Indianola, Iowa.
SMITH, A. HOMER, MR. AND MRS., Baltimore, Md.
SMITH, DANIEL H., Washington, D. C.
SMITH, F. A. UPSHER, St. Paul, Minn.
SNOW, CLYDE M., MR. AND MRS., Chicago, Ill.
SOHL, GEO. A., Baltimore, Md.
SOLLOD, JOS. A., Baltimore, Md.
SOLOMON, SIMON, Baltimore, Md.
SOLOMON, WILLIAM, MR. AND MRS., Baltimore, Md.
SONDERN, CLARENCE WILLIAM, New York, N. Y.
SONNEBORN, A. A., Baltimore, Md.
SPEASE, EDWARD, MR. AND MRS., Cleveland, Ohio.
SPIRE, W. B., MR. AND MRS., Mt. Rainier, Md.
STAGMER, E. R., Baltimore, Md.
STANBURY, R. B. J., Toronto, Canada.
STAPLETON, R. E., Baltimore, Md.
STAUFFER, JESSE E., Rifle, Colo.
STAUFFER, L. E., Baltimore, Md.
STEHL, EDWIN, MR. AND MRS., Baltimore, Md.
STEIGER, LEONARD W., Hackensack, N. J.
STEINER, D. E., MR. AND MRS., Baltimore, Md.
STEINER, HENRY R., Baltimore, Md.
STERLING, ROBT W., Dixon, Ill.
STERLING, MARY E., Dixon, Ill.
STOCKING, CHAS. H., Ann Arbor, Mich.
STRASBURGER, MR. AND MRS., Baltimore, Md.
STROUP, FREEMAN P., Philadelphia, Pa.
SWAIN, R. L., MR. & MRS., Baltimore, Md.
SWANSON, EDWARD E., Indianapolis, Ind.
SWEENEY, JOHN J., Baltimore, Md.
SWISHER, MARGARET C., Buffalo, N. Y.

TAGG, NORMAN H., Baltimore, Md.
TAIBER, EDWIN E., Freeport, L. I., N. Y.
TAIBER, MINNA, Freeport, L. I., N. Y.
TAYLOR, AUGUSTUS CARRIER, MR. AND MRS., Washington, D. C.
TAYLOR, FRANK O., Detroit, Mich.
TAYLOR, WINFIELD SCOTT, Trenton, N. J.
TERRY, RALPH E., MR. AND MRS., Elmhurst, Ill.
THOMAS, OSCAR B., Baltimore, Md.
THOMPSON, MARVIN R., MR. AND MRS., Washington, D. C.
TOWNSEND, RUPERT RICHARD, La Mesa, Texas.
TROWBRIDGE, H. O., Baltimore, Md.

VERTISKA, RUDOLPH, Humboldt, Neb.
VIEHOEVER, ARNO, Swarthmore, Pa.
VILAS, FRED LESLIE, Pierre, S. Dak.
VOGEL, W. W., MR. AND MRS., Baltimore, Md.

WADDEL, S., Washington, D. C.
WAGNER, KATHERINE G., Baltimore, Md.
WAGNER, MANUEL B., MR. AND MRS., Baltimore, Md.
WAGNER, R. H., Baltimore, Md.
WALKER, PERCY S., Topeka, Kans.
WALTON, LUCIUS LEEDOM, MR. AND MRS., Williamsport, Pa.
WANNENWITSCH, JOHN F., Baltimore, Md.
WARFIELD, DELMA LENORE, Baltimore, Md.
WARFIELD, MR. AND MRS., Baltimore, Md.
WARREN, LEWIS E., Washington, D. C.
WARREN, HELEN WIXSON, Chevy Chase, Md.
WARRENFELTZ, J. FRED, Hagerstown, Md.
WATCHMAN, H. H., MR. AND MRS., Baltimore, Md.
WATCHMAN, ANNA, Baltimore, Md.
WEAVER, DUNCAN, MR. AND MRS., Finnville, Mich.
WEBSTER, GEORGE L., Chicago, Ill.
WELFARE, SAMUEL EUGENE, Winston-Salem, N. C.
WELLCOME, H. S., London, England.
WELLER, HARRY, MR. AND MRS., Baltimore, Md.
WESTON, J. W. AND FAMILY, Baltimore, Md.
WHELPLEY, LAURA EUGENIE, MRS., St. Louis, Mo.
WHITEHEAD, C. L., Baltimore, Md.
WHITTLE, W. A., Baltimore, Md.
WHORTON, CARL, Gadsden, Ala.
WICH, H. E., MR. AND MRS., Baltimore, Md.
WICKS, H. O., Baltimore, Md.
WILDER, EARLE MAURICE, Baltimore, Md.
WILHELMI, GEORGE, Newport, Ky.
WILLIAMS, L. S., MR. AND MRS., Baltimore, Md.
WILLIAMSON, R. E. LEE, MR. AND MRS., Baltimore, Md.
WILLIAMSON, THOS. A., Baltimore, Md.
WILSON, CHARLES E., Corinth, Miss.
WILSON, ROBERT C., Athens, Ga.
WIMMER, CURT PAUL, MR. AND MRS., New York, N. Y.
WINNE, A. L. I., Richmond, Va.
WIRTH, ADAM, New Orleans, La.
WISOTZKI, GUY, Baltimore, Md.
WOEHNER, WALTER A., Great Falls, Mont.
WOHNLICK, F. P., MR. AND MRS., Baltimore, Md.

WOLF, E. W., Baltimore, Md.
WOLF, JAMES CARLTON, Baltimore, Md.
WOOTEN, P. O., MR. AND MRS., Baltimore, Md.
WRIGHT, LELAND, MR. AND MRS., Baltimore, Md.

YINGLING, RAYMOND B., MR. AND MRS., Baltimore Md.
YOKES, RUTH C., Baltimore, Md.

YOUNGKEN, HEBER W., MR. AND MRS., Arlington, Mass.

ZEIGLER, WASHINGTON HAYNE, MR. AND MRS., Charleston, S. C.
ZEPP, MR., Baltimore, Md.
ZIEFLE, ADOLPH, MR. AND MRS., Corvallis, Ore.
ZOELLER, E. V., Tarboro, N. C.
ZUFALL, C. J., Lafayette, Ind.

ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1929–1930.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 10.

May 16, 1930.

To the Members of the Council:

The Second Meeting of the Council was held in the Hotel Emerson, Baltimore, Md., on Monday, May 5, 1930, beginning at 9:15 A.M. The following members were present: Bradley, Philip, Christensen, Dunning, Hilton, Beal, Eberle, DuMez, Swain and Kelly.

The reading of the minutes of the previous meeting was dispensed with as they had been published.

The Secretary reported that Motion No. 26 (see Council Letter No. 9, page 299) had been carried.

No. 77.—Committee on Finance. A verbal report was submitted by Chairman Bradley and the report was accepted on motion of Philip, seconded by Christensen, and carried.

No. 78.—Committee on Property and Funds. The following report was submitted by Chairman Dunning and on motion of Philip, seconded by Eberle and carried, the report was accepted and approved:

> "To the Chairman and Members of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION:
>
> "In accordance with Article VI of Chapter IV of the By-Laws of the Council, the Committee on Property and Funds hereby recommends to the Council the following banks and safe deposit vaults:
>
> DEPOSITORIES FOR FUNDS.
>
> The Baltimore Trust Company, Baltimore, Md.
> Drovers and Mechanics National Bank, Baltimore, Md.
> Merchants & Newark Trust Company, Newark, N. J.
> Boston Penny Savings Bank, Boston, Mass.
>
> DEPOSITORY FOR SECURITIES AND DEEDS.
>
> Baltimore Trust Company, Baltimore, Md.—Safe Deposit Boxes."

No. 79.—Committee on Publications. The following report was read by Eberle for Chairman DuMez:

"Your Committee on Publications respectfully submits the following report on its activities since the meeting held in Rapid City, South Dakota, and on the present status of the ASSOCIATION'S publications:

Journal: The total expenditures for the publication of the JOURNAL for 1929, including the Editor's salary were $19,885.92 ($14,885.92 + $5000.00). The total expenditures for 1928 were $19,331.62 ($14,331.62 + $5000.00), which represents an increase of $554.30.

The receipts of the JOURNAL for advertising, subscriptions, sale of single copies, reprints, etc., for 1929 were $10,531.21. The subscription credit amounted to $7320.20, making the total receipts $17,851.41. As the receipts for 1928 amounted to only $16,344.40, this represents an increase of $1507.01.

The total expenditures of $19,885.92 less the receipts of $17,851.41 shows the net cost of the JOURNAL for the year to be $2034.51. The net cost for 1928 was $2987.22, which represents a decrease of $952.71.

The JOURNAL is still being printed and distributed by the Mack Printing Company of Easton, Pa.

Further details relative to the publication of the JOURNAL will be presented by Editor Eberle.

Year Book: The status of volumes Nos. 16 and 17 of the YEAR BOOK is much the same as described in the last report, except that the printing is further advanced. The work in connection with getting out the index was greater than expected, which delayed the completion of my portion of the manuscript. It is expected, however, that there will be no further delay and that the book will be off the press in the very near future.

Index of Proceedings and Year Books: As already stated, the publication of the Index entailed more work than was anticipated. It was estimated that it would be a volume of 600 to 700 pages, and it turned out to be one of nearly 900 pages; but the job was finally completed and the first copies were sent out on April 25th. It is hoped that it meets with your approval.

As the bill for printing, binding and distribution has not been received to date, accurate information relative to the total cost cannot be given at this time.

National Formulary: Up to March 1, 1930, a total of 39,584 copies were printed and bound in buckram and 500 copies were bound in leather. Of the number bound in buckram 37,606 copies had been sold and 75 distributed gratis. Of the number bound in leather, 129 copies had been sold and 12 copies had been distributed gratis. There were sold during the year 4209 copies bound in buckram and 2 copies bound in leather, leaving a stock on hand of 1903 copies bound in buckram and 359 copies bound in leather.

During the year permission was granted to use portions of the text to the following: B. L. Maltbie, Newark, N. J., for Maltbie's Practical Pharmacy; Lea and Febiger, Philadelphia, Pa., for Bradley's Pharmaceutical Arithmetic; Dean Edward Spease, Cleveland, Ohio, for a textbook on Pharmaceutical Mathematics; Lea and Febiger, Philadelphia, Pa., for Chas. H. Rogers' Pharmaceutical Chemistry; Edward J. Smith, Bronx, N. Y., for a textbook on Practical Pharmacy; P. Blackiston's Son & Co., Inc., for a textbook on Properties and Uses of Drugs by Rusby, Bliss and Ballard; and a request from M. A. Starkman for permission to use portions of the text in a book on Operative Pharmacy is now before us.

Pharmaceutical Recipe Book: Up to March 1, 1930, 5000 copies of the Recipe Book had been printed and bound. Of this number, 2116 copies had been sold and 88 complimentary copies had been distributed, leaving a stock on hand of 2796 copies.

In conclusion, your Committee desires to again thank the members of the ASSOCIATION for their coöperation in promoting the interests of our publications and to thank the editors of the various pharmaceutical journals for the fine spirit which they have shown toward our publications and for their coöperation in giving publicity to our activities.

On motion of Swain, seconded by Dunning and carried, the report was accepted.

No. 80.—Committee on Standard Program. Chairman Hilton submitted a verbal report for the committee reviewing its activities, pointing out that the only departure for this meeting was that the Conference of Pharmaceutical Association Secretaries and the Conference of Pharmaceutical Law Enforcement Officials were given positions similar to the Sections. The report was accepted on motion of Bradley, seconded by Christensen and carried.

No. 81.—Committee on A. Ph. A. Branches for Students. Chairman Philip advised that a joint meeting of his committee and that from the American Association of Colleges of Pharmacy would be held later in the day and stated that his report would be submitted later. The question of student branches was generally discussed but no action was taken.

No. 82.—Committees on National Formulary, on Pharmaceutical Research and on Unofficial Standards. The reports of these committees were deferred.

No. 83.—Editor of the Year Book. Editor DuMez submitted the following report:

Volumes 16 and 17 of the YEAR BOOK are still in the hands of the printer. The work of printing the manuscript furnished by Doctor Arny was finished several weeks ago, but the unexpected amount of work in connection with getting out the Collective Index and press of work at the College has delayed the completion of my portion of the manuscript. I expect to get at

the work again after the first week in June and the book should be ready for mailing out 60 days later.

In connection with the future of this work, I desire to call your attention to the fact that a complete review of the literature under our present system of abstracting is now impossible owing to the many new publications which have come into existence since the war, and to the enormous increase in material published in the fields of chemotherapy, glandular therapy, pharmacology, etc. I would also bring to your notice the fact that there are now being published in this country several abstract journals, *e. g.*, Chemical Abstracts, Biological Abstracts and Physiological Abstracts, which cover certain fields now covered by the YEAR BOOK much more thoroughly than we can ever expect to, and these have added advantage in that they are issued monthly and in one case semi-monthly. It therefore seems to me that the time has arrived when a change on our part is necessary and that this body should take up the matter of working out a definite policy with respect to the future of this work. With this end in view, I recommend that a committee be appointed at this time to ascertain the views of the groups interested, namely, pharmacists, botanists, pharmacognosists, chemists, pharmacologists, etc., and to render a report ar our next annual meeting based on their findings.

The report was accepted and the Chairman of the Council was authorized to appoint, after mature consideration, a committee of five members, not necessarily members of the Council, as recommended in the report, on motion of Bradley, seconded by Beal, and carried.

No. 84.—Editor of the Journal. The following report submitted by Editor Eberle was received on motion of DuMez, seconded by Beal, and carried:

The report of the Editor presented herewith deals with the business of 1929 and as in other reports of other years this is compared with the preceding twelve months.

The expenses of 1928 were $14,331.62, not including the Editor's salary; the receipts were $10,437.53. Deduct the latter from the former and we have a cost of $3894.09; adding the Editor's salary, $5000, there is a total cost of $8894.09. Not counting back numbers and copies sent out to state association officers, board members, etc., there was an average monthly circulation of 5403, and dividing into 8894.09 shows an annual cost of $1.64 per volume to the ASSOCIATION, or crediting the JOURNAL with one-half of paid dues for the year (not Headquarters members), less 20% overhead, which was $5906.87—this deducted from $8894.09, leaves a net annual cost of the JOURNAL for 1928, including the Editor's salary, of $2987.22.

The expenses of 1929 were $14,885.92, greater by $554.30, not including the Editor's salary; the receipts were $10,531.21, greater by $93.68. Deduct the receipts (not including credit on membership subscriptions) from expenses—shows a cost of $4354.71; add the Editor's salary we have a cost of $9354.71, or a gross cost of $1.76 per volume. The credit on membership subscriptions—one-half of paid dues for the year (not Headquarters members), less 20% for overhead, which for 1929 is $7320.20, deducted from gross cost, $9354.71, leaves net $2034.51 for 1929 against net cost of $2987.22 for 1928, in both instances including the Editor's salary.

The number of copies printed in 1928 were 65,600; in 1929, 65,500. The number of reading pages in the volume for 1928 were 1260, in 1929, 1286, a difference of 26 pages.

The publication costs in 1928 were $10,213.70; those of 1929, $10,685.01. Mailing costs of the JOURNAL in 1928 were $592.50, those of 1929, $604.88. Mailing back numbers in 1928, $28.61; those in 1929, $33.16; office postage and parcel post in 1928 amounted to $228.29; in 1929, $243.57. Photographs and engravings other than those from Mack Printing Company in 1928, cost $302.95; in 1929, $245.71. Binding journals in 1928 cost $37.55; in 1929, $27.25; Stationery and office supplies in 1928 cost $79.45; in 1929, $86.00. Hauling and freight in 1928, cost $7.67; in 1929, $11.13. Affidavits in 1928, 50 cents; in 1929, 25 cents. Telephone and telegraph service in 1928, cost $70.64; in 1929, $73.47. Clerical, including Professor Olsen's contributions to Department of Business Management, in 1928, cost $1324.00; in 1929, $1391.00. Commission on advertising in 1928, cost $579.72, in 1929, $663.63. Reprints in 1928 cost $856.04; in 1929, $815.38. Refund on over-paid accounts in 1929, amounted to $5.23.

The receipts for 1928 were $10,437.53; for 1929, $10,531.21. Advertising in 1928, brought $7565.75; in 1929, $7795.66. Subscriptions in 1928 amounted to $841.95; in 1929, $956.07. Single copies and bound volumes in 1928, brought $222.05; in 1929, $138.77. Receipts from miscellaneous items in 1928 amounted to $783.65, from the following sources—National Association of Boards of Pharmacy, $477.50; American Association of Colleges of Pharmacy, $300.00. Re-

prints, N. F. Titles, $6.00; type cut, 15 cents. In 1929, the miscellaneous items amounted to $755.09 from the following sources: National Association of Boards of Pharmacy, $417.50; American Association of Colleges of Pharmacy, $300.00; Binding Journals, E. F. Kelly, $1.75; E. G. Eberle, $1.50; Electros, G. D. Searle & Co., $34.34. From reprints in 1928, $1024.13; in 1929, $885.62. The receipts from advertising in 1929 were slightly in excess of those in 1928; also the receipts from subscriptions and single copies. All of the foregoing details of receipts and expenses were audited as has been reported. The American Association of Colleges of Pharmacy has continued the subscription of $300.00 toward the expenses of its department. While the National Association of Boards of Pharmacy has somewhat reduced its space in the JOURNAL, we are pleased to have the coöperation of both bodies and thank Professor Cooper, Dean Jordan and Secretary Christensen for their helpfulness.

The contract in 1929 was renewed with the Mack Printing Company on the same basis as for 1928.

The roster in each issue of the JOURNAL has been found useful and while not entirely successful in keeping it up-to-date, we are more frequently receiving reports which support our efforts. It is hoped that eventually every member of the Boards and officers of the Association will hold membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

The large number of papers presented at recent annual meetings has made it impossible to publish all of them before the annual meeting, somewhat due to the short year; it is hoped that this may be offset by the succeeding longer interval between annual meetings.

The Department of Business Management under the direction of Prof. Paul C. Olsen is being continued and is receiving favorable comment. The Bibliography of Pharmaceutical Research is being prepared each month by Editor DuMez and every month there is evidence of its use in libraries and laboratories.

The number of articles bearing on U. S. P. revision are increasing and effort has been made, as far as possible, to give these preference in publication. No specific references will be made to articles that have appeared in the JOURNAL for 1929, and the months of the present year, but the importance of them add to the value of the publication, and the work of the ASSOCIATION for the advancement and service of pharmacy.

It is pleasing that there is a growing desire on the part of research workers to have their reports published in the JOURNAL, not infrequently to the extent of being willing to wait until place can be made for publishing their investigations. While we could use more pages in the JOURNAL to advantage, necessity limits them. The aim is constantly directed to have the JOURNAL representative of the ASSOCIATION which it serves in its promotions and endeavors.

It is to be hoped that the time will come very soon when an endowment will enable the JOURNAL to extend and render greater service. We have a number of very lengthy papers of particular interest to a more or less limited number. An effort has been made to induce one or more whose activities will perhaps benefit by their publication to defray the expense of having these issued as monographs; thus far, however, unsuccessfully.

Thus far the JOURNAL has been able to maintain the number of its advertising pages, but due to conditions there have been changes. Your coöperation in maintaining and adding to the advertising patronage is respectfully asked for, and for your assistance the Editor is thankful.

Chairman DuMez of the Committee on Publications called attention to the difficulty of printing all of the papers submitted at this meeting and others offered the JOURNAL, without increasing the number of pages of the publication.

No. 85.—Use of the Text of the N. F. V. Upon recommendation of the Committee on Publications and on motion of DuMez seconded by Kelly and carried, Prof. M. A. Starkman was given permission to use portions of the text of the N. F. V for partial reproduction in his proposed manual on Operative Pharmacy and at the usual charge of $5.00.

No. 86.—Committee on Pharmacy Week. The following letter and financial report by Chairman Ruth was read:

> "Attached hereto is my report of expenses for the 1929 National Pharmacy Week campaign.
>
> "You will note that of the $500.00 appropriated jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists in 1928, there

remained a balance of $274.24. This amount served to finance the 1929 campaign and there was a balance on hand January 1, 1930 of $4.34.

"It will be necessary for the Pharmacy Week Executive Committee to request a new appropriation for 1930. I have spoken concerning this matter with Mr. Jos. W. Noble, the newly appointed Chairman of the National Association of Retail Druggists Committee on Pharmacy Week and accordingly, I am making the request for the appropriation at this time.

"I should like to receive the $500.00 appropriation ($250.00 from the AMERICAN PHARMACEUTICAL ASSOCIATION and $250.00 from the National Association of Retail Druggists) as soon as possible as we are already starting the 1930 Pharmacy Week campaign. It will be necessary to get some stationery printed at once as we are entirely out of envelopes and have only a few of last year's letterheads left of the 2000 which we had printed. I am also assembling material for an impressive Pharmacy Week exhibit for the AMERICAN PHARMACEUTICAL ASSOCIATION convention the week of May 5th. This material will be preserved for a similar exhibit to be set up at the National Association of Retail Druggists Drug Show or in the convention hall at Atlantic City.

"In connection with the expense report, I might add that I have in my files the receipts and cancelled checks covering the main expenditures which will be available for your auditing committee at any time that they may wish to audit my account.

"I am sending a copy of this statement to the Secretary of the National Association of Retail Druggists."

NATIONAL PHARMACY WEEK.

Expenses for 1929.

Printing of letter heads and envelopes; mimeographing and multigraphing of letters and release articles	$44.09	
Stenographic services	97.75	
Postage	56.50	
Telegrams and long distance telephone	43.36	
Cabs and incidentals	18.20	
To Fred. C. Wright, Chairman of N. A. R. D. Committee on Pharmacy Week (for expenses)	10.00	$269.90
Unexpended portion of budget appropriated in 1928		$274.24
(This remained as a balance from $500.00 appropriated jointly by the A. PH. A. and the N. A. R. D. for the 1928 campaign.)		
1929 Expenses		269.90
Balance on hand January 1, 1930		$ 4.34

Robert J. Ruth, *National Chairman*,
Joint Committees of the A. PH. A. and the
N. A. R. D. on Pharmacy Week.

The report and statement were received and filed and the appropriation of $250.00 as requested, was added to the budget for 1930, on motion of Bradley seconded by Dunning, and carried.

No. 87.—Election of Members. On motion of Bradley seconded by Beal and carried, the following applicants were elected members on account of the payment of dues:

No. 206, Frederick B. Balmer, 185 N. Wabash Ave., Chicago, Ill., No. 207, Rodney Allan Barb, c/o F. S. Johnston Drug Co., Parsons, W. Va.; No. 208, Alfred Barol, 4537 N. Camac St., Philadelphia, Pa.; No. 209, Wilfrid J. Bedworth, 54 W. Northrup Place, Buffalo, N. Y.; No. 210, R. D. Bienfang, 609 Linden Ave., Jefferson, Wis.; No. 211, Harry E. Bolen, Phi Delta Chi, Chapel Hill, N. C.; No. 212, Howard J. Bolton, 4356 Drexel, Detroit, Mich.; No. 213, Paul J. Bowers, 258 N. Bellefield Ave., Pittsburgh, Pa.; No. 214, Edgar Breakstone, 5629 Darlington Road, Pittsburgh, Pa.; No. 215, Burt L. Brooks, 6069 Cherry Ave., North Long Beach, Calif.; No. 216, Dale W. Brothers, 2136 East Midlothian Blvd., Youngstown, Ohio; No. 217, Wilfred Chagnon, 425 Centre St., Newton, Mass.; No. 218, Leonard W. H. Charnock, 2500 South Dearborn St., Chicago, Ill.; No. 219, E. E. Colby, 2041 W. 35th St., Chicago, Ill.; No. 220, Ray P.

Craig, 206 Cameron Ave., Chapel Hill, N. C.; No. 221, Carl Damschinsky, 142 East 34th St., New York, N. Y.; No. 222, Arthur Davis, 448 Broadway, Portland, Oregon; No. 223, Charles Doessereck, 256 East 134th St., New York, N. Y.; No. 224, J. A. Donovan, 2824 Delaware Ave., Kenmore, N. Y.; No. 225, Albert Dougherty, 816–818 Maryland Ave., Wilmington, Del.; No. 226, James Arthur Dunn, 1904 Fourth St., Altoona, Pa.; No. 227, Ellis Dye, Jackson Center, Pa.; No. 228, Leonard J. Finkle, 247 E. Union St., Bethlehem, Pa.; No. 229, W. H. Ford, 11717 Euclid Ave., Cleveland, Ohio; No. 230, A. T. Griffin, Kappa Psi, Chapel Hill, N. C.; No. 231, C. J. Hall, 1734 North Main St., Los Angeles, Calif.; No. 232, A. L. Harris, 206 Cameron Ave., Chapel Hill, N. C.; No. 233, J. Henry Healy, 1201 Chestnut St., Philadelphia, Pa.; No. 234, John Hampton Hoch, 15 Tradd St., Charleston, S. C.; No. 235, C. L. Jefferies, Ashland, Ky.; No. 236, M. R. MacFarlane, President, Canadian Pharmaceutical Association, Almonte, Ont. Can.; No. 237, Saul Mahler, 961 Fetterly Ave., Los Angeles, Calif.; No. 238, Henry W. Miller, c/o Armand Company, Des Moines, Iowa; No. 239, Reginald G. Morrison, Linden Ave. & Dolphin St., Baltimore, Md.; No. 240, Julius Nasatir, 100 E. Main St., Visalia, Calif.; No. 241, Edward Neimeth, 3561 Bodford Ave., Brooklyn, N. Y.; No. 242, E. J. Parr, 118 Ives Ave., Big Rapids, Mich.; No. 243, Jack Milton Teich, 1200 Allegheny Ave., Pittsburgh, Pa.; No. 244, F. E. Rollins, 69 Broad St., Boston, Mass.; No. 245, Dr. Jesus C. Romero, 3a. Gonzalez Bocanegra 78, Mexico, D. F.; No. 246, Nelson Scribner, Western Reserve University, School of Pharmacy, Cleveland, Ohio; No. 247, George Jacob Simpson, 26 Cooper Sq., New York, N. Y.; No. 248, Albert Charles Smith, 220 Waldron St., West Lafayette, Ind.; No. 249, Mrs. A. M. Stringham, 916½ W. 41st Drive, Los Angeles, Calif.; No. 250, José P. Sugranes, Pimentel No. 5, Rio Grande, P. R.; No. 251, Charles A. Susslin, c/o Vince Laboratories, Inc., 308 W. 141st St., New York, N. Y.; No. 252, Carl J. Turner, Assistant Manager, Lucky Tiger Remedy Co., 6th & Delaware, Kansas City, Mo.; No. 253, Harry Frederick Wagner, 8967 214th St., Queens Village, N. Y.; No. 254, Paul Joseph Watters, 5403 Coral St., Pittsburgh, Pa.; No. 255, Christ A. Zoes, 168 N. Sangamon St., Chicago, Ill.; No. 256, Paul Leo Poddecord, 132 East 8th St., Leadville, Colo.; No. 257, Willard S. Richardson, 1326 Farragut St., Washington, D. C.; No. 258, David W. Haering, 3326 Monroe St., Chicago, Ill.; No. 259, Bernard J. G. Chiego, 152 8th Ave., Newark, N. J.

The following applicant was elected a member on account of his subscription to the Headquarters Building Fund:

H-7, Louis Bernard Ortega, 557 West 148th St., New York, N. Y.

No. 88.—Election of Life Members. D. F. Jones was elected a Life Member on motion of Beal seconded by Bradley and carried, on account of his subscription of $1000 to the Headquarters Building Fund.

No. 89.—Election of Honorary Members. The following communication was read:

To the Members of the Council, A. Ph. A.

Following your instructions, I have given attention to nominations for honorary membership in the ASSOCIATION and I submit the following as being worthy of our recognition.

Dr. Albert Goris (Doctor of Natural Sciences) Chief Pharmacist of the Hospital, and Director of the Pharmacie Centrale des Hopitaux et Hospices civile of Paris, Laureate of the Institute of the Academy of Medicine, member of the Codex Commission, Chevalier of the Legion of Honor, professor of Galenical Pharmacy in the School of Pharmacy of Paris since 1925.

Dr. Goris carried on all of his pharmaceutical studies in the Faculty of Pharmacy of Paris. His researches concerning the chemistry of vegetable extracts and principles are well known. His first work to draw attention dealt with the curious structure of the roots of aconite. He is also well and favorably known for his researches relating to alkaloids, glucosides, etc.; also, for his work on Kola from which he succeeded in isolating kolatine and kolateine.

My correspondent advises me that Dr. Goris after being elected to the directorship of Pharmacie Centrale des Hopitaux et Hospices civils, spent four years in organizing this important pharmaceutical system and has done this so completely that it may be regarded as a new institution of great public service to pharmacy as well as to the city of Paris.

Dr. Rudolpho Albino Dias da Silva, graduated from the School of Medicine and Pharmacy of Rio de Janeiro in 1908. He is professor of Pharmacognosy at his Alma Mater. He has been president for two terms of the Brazilian Association of Pharmacists.

Among his works are the following:

Pharmacopœia des Estados Unidos de Brazil (Brazilian Pharmacopœia), approved by Federal Government's Decree No. 17,509, of November 4, 1926.

Monographia das Falsas Poayas de Brazil (Monograph of False Ipecacuanha Roots of Brazil).

Monographia das Plumbaginaceas Brasileiras (Monograph of Brazilian Plumbagos).

Also other pharmaceutical, botanical and chemical studies on various medicinal Brazilian plants.

Dr. Parada graduated in pharmacy at the University of Chile in 1914 and in medicine in 1919. In 1916 he was elected to professorship of Pharmacy and Toxicology. In 1926 he was made director of the School of Chemistry and Pharmacy. This position he now holds. He organized the Urgency Central Pharmacy of Public Aid, now functioning. In 1924 he was named an officer of army sanitation in Chile and organized the laboratories of bacteriology, chemistry, serology and chemistry of the Military Institute of Social Hygiene.

In 1929 he was named a member of the Commission for the Revision of the Sanitary Code making a special study of pharmaceutical studies. It was due to his efforts that the School of Pharmacy in Santiago secured an independent building.

Among his works are: "Farmacia Galenica" used as a textbook in the School of Pharmacy of the University of Chile.

Respectfully,
E. G. Eberle.

On motion of Eberle, seconded by Beal and carried, the following were elected as Honorary Members of the ASSOCIATION:

Dr. Albert Goris of Paris, France
Dr. Rudolpho Albino Dias da Silva of Rio de Janeiro, Brazil
Dr. Armando Soto Parada of Valparaiso, Chile

No. 90.—Nomination of Honorary President, Secretary and Treasurer of the Association. It was moved by Bradley that Elie H. LaPierre, Cambridge, Mass., be nominated to the House of Delegates as *Honorary President;* E. F. Kelly, Baltimore, Md., as *Secretary;* and C. W. Holton, Essex Fells, N. J., as *Treasurer* of the ASSOCIATION for 1930–1931. The motion was seconded by DuMez and carried.

No. 91.—Annual Report of the Council to the House of Delegates. Beal moved that the Chairman and Secretary be authorized to prepare and present the annual report of the Council to the House of Delegates. The motion was seconded by Dunning and carried.

No. 92.—Life Members. The Secretary announced that Messrs. C. W. J. H. Hahn, C. F. Heebner, H. A. Pearce, E. A. Ruddiman and H. J. Sherwood have become Life Members through the payment of dues for 37 consecutive years, and that B. Olive Cole has become a Life Member through the payment of $50.00.

There being no further business the Council then adjourned to meet at 9:00 A.M., Thursday, May 8, 1930.

THIRD MEETING OF COUNCIL.

The Third Meeting of the Council for 1929–1930 was held during the forenoon of Thursday, May 8th. The following members were present: Hilton, Arny, Philip, Christensen, Dunning, Beal, Caspari, LaWall, Winne, Goodyear, Eberle, DuMez and Kelly.

The order of business was changed to permit the reading of reports deferred from the second meeting.

No. 93.—Committee on National Formulary. Chairman Gathercoal read the following report:

"The new N. F. Committee is only getting well acquainted and as yet has hardly completed its full organization.

"At the request of Secretary Kelly, Ex-Chairman Scoville served as temporary chairman of the new N. F. Committee until the election of its officers last December. With his characteristic fairness and expedition, Doctor Scoville conducted the nomination and election with the following results:

Chairman, E. N. Gathercoal, Chicago
Vice-Chairman, Louis Saalbach, Pittsburgh
Secretary, Adley B. Nichols, Philadelphia.

The Committee began its work with the first issue of the N. F. Bulletin on January 8, 1930, and to date has acted upon eight items of business.

The very able report of Chairman Scoville of the Committee on National Formulary, Fifth Edition, presented at Rapid City, last August, is the foundation of this report. The following recommendations and suggestions are offered:

ON SCOPE.

1. It Is Recommended That: The N. F. Committee be authorized to appoint a sub-committee consisting of the Chairman of the Committee and three Committee members, to confer with a similar sub-committee from the U. S. P. Revision Committee on the matter of scope of these two books;

And That: The payment of the expenses of this N. F. sub-committee be authorized;

And That: The Chairman of the N. F. Committee be directed to communicate promptly with the Chairman of the U. S. P. Revision Committee, if this recommendation is adopted, regarding such a conference and the appointment of such a U. S. P. sub-committee.

NOTE: Such a conference as suggested above could consider:

First, the suggestions of Doctor Scoville; namely,

"The time has now come when the Committee must face squarely the fact that the demand for formulas in retail pharmacy is steadily diminishing, and if the National Formulary is to continue and exert a real influence in pharmacy, a somewhat radical change in scope may be necessary.

"If the National Formulary is to continue as a legal standard, it must be revised on a different basis from that of the Pharmacopœia. Otherwise the books will be rivals, not adjuvants. The scope of the Pharmacopœia is determined by therapeutic consideration, that of the National Formulary by common usage by physicians of all schools. The Pharmacopœia is essentially a book of standard therapeutic remedies, the National Formulary is essentially a book of standard formulas, not recognized by the Pharmacopœia. The Formulary has consistently denied any therapeutic judgment or responsibility. It can recognize any formula on this basis, but it is difficult to see how it can recognize any drug or chemical except as ingredients of these formulas, or else exercise therapeutic judgment."

Second, the suggestion of Professor E. Fullerton Cook; namely:

"Drugs and chemicals which have been dismissed from recent editions of the U. S. P., but which did not find a place in the N. F., because of the policy that 'simples' are not standardized unless they enter an N. F. formula, will remain unstandardized under the Food and Drugs Act unless the N. F. broadens its policy and admits such substances.

"In my opinion this is desirable and would also permit of recognition for some other drugs and chemicals now being standardized by the Committee on Unofficial Standards, but which standards must remain without legal force unless placed in the U. S. P. or N. F."

Doctor Scoville says, on this point,

"This question merits some attention by the next Committee, and its crux lies in the problem of how to admit such 'simples' without rivaling, or seeming to criticize the Pharmacopœia on the one hand, or making a book so voluminous as to rival the Dispensatories on the other hand."

Third, the suggestions of the Board of Pharmacy of the State of New Jersey; namely:

"It is the opinion of the Board of Pharmacy of the State of New Jersey that it would be advisable to have the Pharmacopœia confined as much as possible to simple drugs and standards for such drugs, and to make the National Formulary what its name implies, a book of formulas, of preparations for internal and external use. This would mean that each of the standard works would have its own field of usefulness and there would be no overlapping of functions.

"The Board further suggests that as far as possible both the Pharmacopœia and National Formulary should be divided into sections based on the use of the articles listed. All therapeutically active articles should be listed in one section, and articles which are merely used as adjuvants or for flavoring purposes and which may be used as foods, condiments or for technical purposes, should be listed in another section, so as to facilitate enforcement of food and drug and pharmacy laws."

It would be well to note here also that steps have been taken by the Chairman to determine the extent of use of the N. F. V galenicals. This investigation is really in four parts; namely:

First, an inquiry directed to the hospital pharmacists in 26 leading and widely distributed

hospitals of the United States. This inquiry is being made under the leadership of Committeeman I. A. Becker.

Second, an inquiry directed to about 200 exclusive prescription pharmacists or retail pharmacies in which prescription compounding is a major item.

Third, an inquiry, through pharmaceutical journals of our country, directed to the rank and file of retail pharmacists.

Fourth, an inquiry directed to ten of the leading pharmaceutical manufacturing houses of the United States, as to the extent of production of N. F. V galenicals.

It is expected that the data as collected will be available for the Committee meeting the last of June.

HANDICAPS TO N. F. DEVELOPMENT.

New remedies, whether biological, new chemicals or new pharmaceuticals, are being constantly brought to the attention of physicians. To meet the demand for standards for these new remedies, "New and Non-official Remedies" has developed. Originally the Committee on Pharmacy and Chemistry of the American Medical Association was formed to consider the suitableness of remedies for advertising in the *Journal of the A. M. A.* The publication of data from the chemical laboratory of the A. M. A., established in 1925, has gradually developed a literature of standards that has, to a certain extent, taken the place of the U. S. P. and N. F. as a guide in materia medica to the physician.

The lack of interest of the physician in the National Formulary is due, to a certain extent at least, to the fact that the N. F. provides no therapeutic guidance to the physician.

The demand of physicians and pharmacists that the U. S. P. include all therapeutically valuable materia medica, whether it be the crude drug or chemical, the simple galenical or the compound galenical, automatically relegates the N. F. to an inferior place.

The very striking remarks of Doctor Scoville from his 1929 Chairman's Report, quoted as follows, are worthy of very serious consideration:

> "Its status as a legal standard, the laws which in some States compel its purchase by each drug store, and its use as a textbook in most of the pharmaceutical colleges, insures a considerable sale and a measure of business success to the National Formulary. But a forced attention is neither very lasting nor helpful, and the Formulary needs to exert a real influence if it is to continue through the coming years.
>
> "Seemingly the National Formulary is very little in the minds of the leaders in pharmacy. It lacks support from some of our own members from whom we might better expect defense. This lack indicates an ignorance of its contents rather than of the book itself.
>
> "How can this be corrected? If the fault is due to defects in the book, to failure in supplying the needs, to a too widely scattered appeal in its contents, or to other inherent shortcomings, the flaw should be found and corrected in the next edition. If the fault is not primarily in the book, then a more efficient advertising is needed.
>
> "Familiarity with books comes with use. If the Formulary is not used it is because it is not fitting commercial conditions. A commercial influence is needed to develop its professional influence. This means that the book must appeal as a commercial help to professional pharmacy. And this involves a wider understanding of the purposes and advantages of its contents."

Therefore,

2. It Is Recommended That: A study looking to the further development of the N. F. be undertaken,

And That: The N. F. Committee be authorized to organize such a study in coöperation with such officers and members of the A. PH. A. as may seem desirable.

And That: This study consider at least the following three items:

First, N. F. Research. With the prospective establishment of a research laboratory in the new A. PH. A. headquarters building, the N. F. Committee should definitely undertake positive and constructive research on every item monographed in the book. One reason why New and Non-official Remedies has proved such a success is that its standards, to a very large extent, have been based upon absolute data recently acquired.

N. F. Research should follow not only chemical, pharmacognostical and pharmaceutical lines of standardization, but also should project itself into the most advanced lines of new research, especially in such pharmaceutical problems as: (*a*) perfect drug extraction with the most suitable menstrua; (*b*) increased ability and permanence of galenicals; (*c*) increased palatibility and elegance of medication; (*d*) more convenience in dosage and dispensing of galenicals.

Second, The National Formulary should be under continuous revision. Upon the completion of the sixth edition, provision should be made for quarterly supplements. These supplements should present the very latest research work in pharmaceutical lines, new forms of medication, and standards for new medicine.

Third, the National Formulary Committee could very ethically take such steps as may seem suitable and desirable for spreading knowledge regarding N. F. galenicals and developing a respect on the part of both physician and pharmacist for N. F. preparations.

3. It Is Recommended That: The Committee be authorized to hold a meeting in the early summer of 1930, at the most central and convenient place for its members, and at a minimum of expense, and that the Council provide by appropriation for the expenses of this meeting.

NOTE: Doctor Scoville, Chairman of the previous N. F. Committee, warmly indorses these Committee assemblies. More work can be accomplished in two days than can be done in months of correspondence, and points of friction and disagreement can frequently be cleared away and a marked unanimity of opinion be developed by these personal conferences.

It has been suggested that the meeting be held the latter part of June or the first of July in or near Cleveland or Detroit.

4. It Is Recommended That: Suitable provision be made in the present office of the Chairman of the Committee for office furniture and equipment to care for the N. F. files, supplies and business;

And That: The Chairman of the N. F. Committee be provided with such stenographic or clerical service as is essential to properly carry on the business of the Committee and the revision of the National Formulary.

NOTE: The University of Illinois School of Pharmacy is providing a stenographer's desk and chair, with typewriter, and steel coat locker, in a comfortable and commodious office, without charge to the N. F. Committee. A steel storage cabinet and steel files, and especially a mimeograph of other duplicating apparatus, along with sundry smaller items of office equipment, should be provided for the N. F. Committee office.

It is suggested that half-time service of a stenographer should provide sufficient help and relieve the Chairman of much clerical detail. The University will pay for the other "half-time" of a full time employee.

IN CONCLUSION.

"*1.* The National Formulary should not depend too extensively on its legal standing for its circulation, but the AMERICAN PHARMACEUTICAL ASSOCIATION should use every possible means to increase its intrinsic value to physicians and pharmacists so that its usefulness and popularity may grow through its own merits.

"*2.* The AMERICAN PHARMACEUTICAL ASSOCIATION should make every effort to so correlate the scope of the National Formulary in connnection with the U. S. Pharmacopœia that the books shall in no sense be rivals but rather adjuvants on an equal footing of usefulness.

"*3.* The AMERICAN PHARMACEUTICAL ASSOCIATION should encourage research on National Formulary problems. A splendid step was taken in this direction when the A. PH. A. Committee on Research at its last meeting adopted the plan of restricting its research grants to problems directly concerning the National Formulary revision.

"*4.* The AMERICAN PHARMACEUTICAL ASSOCIATION should use every reasonable effort to make known the value of this book to physicians and pharmacists. This is the day of advertising, and the popularity and usefulness of the most standard and valuable items are increased through proper advertising.

"*5.* The AMERICAN PHARMACEUTICAL ASSOCIATION should develop a widened vision of the importance of the National Formulary to the ASSOCIATION and to pharmacy as a profession. We should not consider as exorbitant an expenditure of $20,000 during the next ten years for revision expenses, nor of a like sum for N. F. research or for advertising the N. F., provided the stand-

ing and usefulness of the National Formulary can be markedly increased, when such expenditures would be amply justified and be fully repaid to the ASSOCIATION."

"To the Council of the A. PH. A.

"In connection with the National Formulary Report, the following items of expense are presented for your consideration:

"*Recommendation No. 1.* This sub-committee of four members probably would not meet with the U. S. P. sub-committee before Fall, but an item of approximately $200.00 would be needed for one such meeting.

"*Recommendation No. 3.* The general meeting of the N. F. Committee for consideration of Scope and General Principles and other items, is very important indeed. The Committee now has 16 members and they are somewhat more scattered than those of the previous Committee. Cleveland, Detroit, Chicago and certain summer resorts nearby are being considered for the meeting. As eight of the Committee members are in the East, six in the central West, and two further West, any of the places named would mean about the same expense for railroad travel. We hope to keep the hotel expense at a minimum by going to a smaller place. However, $1200 should be appropriated for the expenses for this Committee meeting."

"*Recommendation No. 4.* Because the University of Illinois has provided much of the needed equipment for an office, the remaining essential items can be kept within $200.00. Stenographic assistance is almost imperative if the business of the Committee is to be kept up in good shape. The offer of the University to pay for half of the salary of a stenographer relieves the situation to a marked degree. We ought to start in a stenographer at $80.00 a month and about the first of September when the Fall activities of the Committee will rapidly develop. We have spent, during December and up to the first of May about $350.00, and, including the expenses of the stenographer for four months and the office equipment should keep well within $1000 for the year."

It was moved by Bradley that the report be accepted, the meetings recommended be approved and that the Secretary arrange for the appropriation for expenses requested. The motion was seconded by Arny and carried.

No. 94.—Committee on Unofficial Standards. The report of this committee was read by Chairman Gathercoal:

"Twelve of the fifteen monographs presented at the Rapid City meeting in the Committee Report have been published in the JOURNAL of the AMERICAN PHARMACEUTICAL ASSOCIATION (XIX, 191–196, 1930). Two bulletins, comprising 18 mimeographed pages, have been issued to the sixteen members of the Committee and to the ten associate members, as well as to the President and Secretary of our ASSOCIATION, the editor of the JOURNAL, etc.

"The Committee has divided itself into two sub-committees; namely, Sub-committee on Crude Drugs, headed by Prof. E. B. Fischer of Minneapolis, and Sub-committee on Chemicals, headed by Dr. J. C. Krantz, Jr., of Baltimore.

"By action of the Council of the A. PH. A. at Rapid City, the Committee on Unofficial Standards becomes a standing committee of the ASSOCIATION and is elected by the Council.

"Considerable attention was given in the Bulletins of the Committee to the more careful organization of the monograph, and the structure of our new monographs very closely follows that of the U. S. P.

"A list of 35 names of unofficial drugs and chemicals has been presented by the Committee for monograph work. Of these, 28 were chosen by Committee members and associates for monograph construction. Several more items have recently been included in the sub-committee work.

"The following tentative monographs have been submitted but are not included in the present report because they have not had the final approval of the entire Committee:

"Methanol, Cerium Oxalate, Bismuth Subiodide, Bismuth Hydroxide, Hydrated Bismuth Oxide, Cascarilla, Marrubium. Many of the other monographs are well under way, and there should be a goodly number ready for publication during this year.

"The matter of scope of the Committee work and the field of its labor is receiving serious consideration from the A. PH. A. Committee on Research. This is a matter of very serious moment to the Committee on Unofficial Standards, for many of the Committee members believe that it should be engaged in standardizing newer remedies as well as the non-standardized older remedies.

"Since the last meeting, Messrs. E. H. Gane and F. R. Eldred have resigned from the Committee. The Council has elected H. W. Youngken, of Boston, in place of Mr. Gane. The resignation of Doctor Eldred has only recently been received and as his term expires in 1930 your Chairman considered it unnecessary to take up the matter of a successor until this meeting.

"Your Chairman, on account of other duties, desires to resign the office he now holds in the Committee and would request to be relieved of the Chairmanship at this time."

"It Is Recommended:

"(*1*) That, the Committe on Research be requested to continue its study of the scope and objective of the future work of the Committee on Unofficial Standards.

"(*2*) That, the Committee be kept at its full strength of sixteen members. The four members whose terms expire this year are E. S. Rose, H. H. Rusby, F. R. Eldred and E. V. Lynn. As the Committee is now divided into two sub-committees, one dealing with Crude Drugs and one with Chemicals and Galenicals, and as the pharmacognosists have but seven members in their sub-committee and the chemists have eight members in their sub-committee, it is recommended that a pharmacognosist be elected to succeed Doctor Eldred.

"(*3*) That, one of the most active, earnest and well-qualified members of the Committee be elected to the Chairmanship. Because he possesses each of the qualities mentioned and because of his invariable courtesy and willingness to serve, your Chairman takes pleasure in commending Dr. John C. Krantz, Jr., to this high office.

"(*4*) That, the ASSOCIATION appropriate at least $100.00 for the Committee expenses for the next fiscal year.

On motion of Christensen seconded by Bradley and carried, the report was received, the recommendations approved and the resignation of Dr. Gathercoal as Chairman accepted with thanks for his services.

The minutes of the second meeting were read and approved, as read, on motion of Goodyear, seconded by Eberle and carried.

No. 95.—A. Ph. A. Branches for Students. The following report drawn up by the joint Committee of the A. A. C. P. and the A. PH. A. and which was approved by the A. A. C. P., was read.

"Report of the Committee of the A. A. C. P. to confer with a Committee of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION regarding the advisability of establishing Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION.

At a joint meeting of the Committees of the A. A. C. P. and of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION held in Baltimore, May 5, 1930, the plan for the establishment of Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION herewith submitted was agreed upon and endorsed.

1. The organization of Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION is considered both feasible and advisable.

2. Student Branches should be organized on the basis of the following provisions:

a. A student membership with full membership in the local student branch and associate membership in the AMERICAN PHARMACEUTICAL ASSOCIATION. Student members to automatically become full members of the AMERICAN PHARMACEUTICAL ASSOCIATION upon graduation from college.

b. Dues to be $5.00, $3.00 of which is to be retained by the AMERICAN PHARMACEUTICAL ASSOCIATION for expense of furnishing publication furnished to members—$2.00 to be remitted to the Student Branch.

"Your committee recommends that the American Association of Colleges of Pharmacy endorse this plan."

On motion of Arny, seconded by Bradley and carried, the report was received and the recommendations adopted.

After a general discussion, amendments to the By-Laws of the ASSOCIATION, providing for the foregoing action were approved for submission to the Second General Session of the ASSOCIATION, on motion of Bradley seconded by Christensen and carried. (These amendments will be reported in the minutes of the Second General Session in June JOURNAL.)

No. 96.—Election of Members. On motion of Caspari, seconded by Winne and carried, the following applicants were elected members on account of the payment of dues:

No. 260, Asa V. Burdine, Washington, D. C.; No. 261, Milton S. Malakoff, 245 Fifth Ave., New York, N. Y.; No. 262, Emmett E. Packer, 28th & Main Sts., Penbrook, Pa.; No. 263, J. W. Searight, 58 N. 18th St., Harrisburg, Pa.; No. 264, Samuel Hope Gilbert, Hotel Klicketat, Portland, Oreg.; No. 265, Marie Jacobs, 42 Buchtel Ave., Portland, Ore.; No. 266, Yeuk Tsun Lam, 142½ Second St., Portland, Ore.

No action was taken on a communication from Secretary Kassner of the New York Branch, A. PH. A., in reference to supplying students with the JOURNAL at a reduced price in view of the approval of the recommendations made by the joint committee on A. PH. A. Branches for Students.

The meeting then adjourned.

E. F. Kelly, *Secretary.*

FOURTH MEETING OF THE COUNCIL.

The Fourth Meeting of the Council was held on Friday, May 9, 1930, beginning at 10:30 P.M., with the following members present: Hilton, Arny, Bradley, Christensen, Dunning, Beal, Caspari, LaWall, Eberle, DuMez and Kelly.

The minutes of the third meeting were approved as read on motion of Caspari, seconded by Arny, and carried.

No. 97.—Committee on Pharmaceutical Research. Chairman Arny read the following report:

"Your committee transacted business since our Rapid City meeting by means of two bulletins. It also held a meeting at Hotel Emerson on May 7th at which 8 of the 14 members were present.

"At our Rapid City meeting your committee recommended to the ASSOCIATION that the grant of 1930–1931 be devoted to specific research problems of National Formulary work. For this reason, with the approval of the members of the committee, no notices of the 1930–1931 award were published in pharmaceutical and other scientific journals. However three requests were received during the past month for grants from the awards of 1930–1931.

"These requests were given due consideration by the committee at its meeting held last Wednesday evening and after comprehensive discussion the following resolution was passed:

"*Resolved*, that the grant of 1930–1931, amounting to the sum of $775.00 be expended under the direction of the chairman of the National Formulary Committee and the Chairman of the Research Committee for specific types of research work connected with N. F. revision; the individual awards being made with the advice and approval of the Research Committee.

"Your committee also passed the following resolution:

"*Resolved*, that the Chairman of the Research Committee be instructed to prepare a résumé of the work performed under the grants made from the research fund since the first award of 1919; said résumé to include name of the recipients of each grant, bibliography of publications resulting from work performed under each grant as well as a short abstract of each publication.

"Your committee begs to point out that the terms of committee members W. L. Scoville and John C. Krantz, Jr., expire at the time of this meeting.

"As the sessions of the ninth annual meeting of the National Conference on Pharmaceutical Research will not take place until after the adjournment of our own meeting, no report is available. Your chairman, however, recommends that our ASSOCIATION renews its membership in the National Conference on Pharmaceutical Research and that it appropriates $25.00 to cover the 1930–1931 dues."

The report was received and the recommendations approved, on motion of LaWall seconded by Bradley and carried.

No. 98.— Election of Members. On motion of Caspari, seconded by Bradley and carried, the following applicants were elected members on account of the payment of dues:

No. 267, Wm. W. McAdoo, 121 So. Canon St., Carlsbad, N. M.; No. 268, Geo. T. Kermott, 205 W. 2nd St., Duluth, Minn.; No. 269, Hugo O. Peterson, 1501 Washington Ave., Minneapolis, Minn.; No. 270, Duncan Weaver, Box 98, Fennville, Mich.; No. 271, Erwin M. Joseph, 1328 W. 6th St., Austin, Texas; No. 272, John H. Frierson, 261 King St., Charleston, S. C.; No. 273, Edgar P. Martin, Hazen, N. Dak.; No. 274, Owen W. McShane, Bentley Ave., Poultney, Vt.; No. 275, J. W. Howard Hurd, 600 S. Saginaw St., Flint, Mich.; No. 276, Charles W. King, 117 Main St., Chicopee Falls, Mass.; No. 277, Charles Estep Reed, 100 N. Main St., Winchester, Ind.; No. 278, J. Ed. Richardson, 8000 Harper Ave., Detroit, Mich.; No. 279,

Charles Gustafson, Jr., 159 New Britain Ave., Hartford, Conn.; No. 280, Hamilton Russell, 212 So. Palafox St., Pensacola, Fla.; No. 281, George Wilhelmi, 1001 Monmouth St., Newport, Ky.; No. 282, George D. Duncan, 514 W. Cedar St., Franklin, Ky.; No. 283, G. E. Porter, Berea, Ky.; No. 284, W. Scott Taylor, Jr., 11 W. State St., Trenton, N. J.; No. 285, W. M. Childs, 1016 S. Denver St., El Dorado, Kans.; No. 286, Thomas H. Cappeau, Delaware Ave. & Dupont St., Wilmington, Del.; No. 287, John H. Weber, Cascade, Iowa; No. 288, Grover C. Bond, 10th and Broadway, Mt. Vernon, Ill.; No. 289, Herve J. Brunelle, 422 E. School St., Woonsocket, R. I.; No. 290, Clare Allan, Wyandotte, Mich.; No. 291, William H. Saunders, Depot St., Lyndonville, Vt.; No. 292, J. E. Stauffer, 101 Third St., Rifle, Colo.; No. 293, Percy M. Davis, 1402 Washburn St., Scranton, Pa.; No. 294, N. M. Hunter, 1042 First St., Fort Myers, Fla.; No. 295, Albert J. Smith, 800 Main St., Bradley Beach, N. J.; No. 296, Rupert R. Townsend, 130 South 1st St., Lamesa, Texas; No. 297, Carl C. Earl. Lander, Wyo.; No. 298, Lester E. Bishop, N. Harper St., Laurens, S. C.; No. 299, C. Graham McCloskey, 57 Broad St., Elizabeth, N. J.; No. 300, Dean B. Crawford, Cor. Florida & Pacific Ave., Atlantic City, N. J.; No. 301, John E. Guess, Hammond, La.; No. 302, Paul Eckels, Crowley, La.; No. 303, Standish B. King, 370 Grove St., Chicopee Falls, Mass.; No. 304, Angel Perez Andre, Calle 1 f Numero 441 esq *a* 98, Vedado, Habana, Cuba; No. 305, Horatio Wales, Jr., Food, Drug and Insecticide Admin., Dept. Agriculture, Washington, D. C.

The meeting then adjourned.

E. F. Kelly, *Secretary.*

BOOK NOTICES AND REVIEWS.

Die Riechstoffe und Ihre Derivate. (Odor Bearing Substances and Their Derivatives.) Unter Mitarbeit von Fachgenossen Herausgegeben von *Dir. Alfred Wagner.* Erste Abteilung: *Aldehyde der Aliphatischen Reihe.* Bearbeitet von Dir. Alfred Wagner, Chem. Alfons Burger, Prof. Dr. F. Elze. A. Hartlebens Verlag, Wien und Leipzig.

This volume is the first of a promised series designed to assemble the chemical knowledge of organic compounds which have proved interesting to the perfumer. Treatment of the subject matter is extensive and detailed. Some conception of content and scope may be conveyed by the following brief description.

Of the 404 pages comprising this book on the aliphatic aldehydes, 72 are devoted to a general introduction to the chemical reactions of aldehydes in general and 332 to a "practical section" which treats the individual aldehydes in monographic fashion. The monograph on citral occupies 108 pages, that of citronellal 70 pages. It is obvious to which aliphatic (sub-classified as olefinic) aldehydes the perfume chemist has hitherto bestowed most of his creative energy and powers of observation! Still the space devoted to the saturated aldehydes, 43 in number, totaled 131 pages, a striking contrast to the few lines received by a scant half dozen of these aldehydes in other treatises a few years ago. The subject matter presented for each aldehyde varies greatly of necessity, but the following subtitles are generally included: history, structure, occurrence, preparation and production, physical properties, chemical reactions, derivatives and identification and genetic relationships. Occasionally statements on the microchemical identification of a given aldehyde are reprinted. The sections devoted to the aldehydes of special importance, particularly citronellal and citral, are much expanded in comparison with the outline just sketched. In addition to these same topics, methods of analysis, commercial production, purification and the synthesis of numerous derivatives are given. The subsection on the higher fatty aldehydes is likewise prefaced by a description of synthetic methods.

At first thought the reviewer was inclined to regard the work as representing a modernized version of Semmler's "Die Aetherischen Oele." However, continued study of the volume developed the impression that the perfume chemist was dominant in the selection of the material and particularly in the manner of its presentation. Wagner's style of treatment resembles that of Houben-Weyl (the volume is dedicated to Prof. J. Houben) in that the central objective seems to be to characterize each "Riechstoff" in detail as an organic chemical and to give exact directions for its preparation. From this point of view it is immaterial whether a given substance is wholly artificial, wholly natural or a hybrid of these origins. Botanical relationships also

are relegated to a quite secondary position. But like Semmler, Wagner has made very extensive use of schematic tables presenting chemical relationships. In fact these tables are an outstanding feature of the book.

From the above description it is evident that a group of specialists headed by a German technologist has undertaken to condense another large block of technical information. Being the product of such an effort "Die Riechstoffe" will be judged by comparison with those monumental handbooks which have been a conspicuous culmination of modern German scientific culture. To pass a final judgment on a work of this scope, particularly with only the first volume at hand, is scarcely the function of a single critic. Essentially such publications are extended abstracts of a specialized literature. Accordingly they are informative guides to the original publications and at most a substitute therefore when the latter are inaccessible to a given investigator. This estimate is not written to disparage the great usefulness of these compendia, but to emphasize the sphere of their special functions. Handbooks in other fields have filled a real need. Doubtless this publication will be of genuine assistance to many workers in commercial laboratories where the pressure of daily tasks and the lack of exceptional library facilities prohibit extended reading. Being written from an "organic" viewpoint, Wagner's "Riechstoffe" ought to appeal more strongly than some other publications in this field to the professors of organic and biochemistry in our colleges. The reviewer commends it to their attention particularly in the hope that it will contribute to a less stilted presentation of "terpene chemistry" than that offered by current textbooks.

R. E. K.

FORMS OF DIGITALIS MEDICATION.

Digitalis infusion is preferred on the Continent since an aqueous extraction of digitalis leaves contains the milder glucosides, *i. e.*, digitalein and gitalin. Stalks and ribs are poorer in glucosides than the leaf-tissue, so that a well-mixed powder should be prepared from the entire leaf. If powdered digitalis leaves contain more than 5% of moisture, decomposition through hydrolysis may take place; to a far greater extent is this the case with aqueous solutions where enzymes oxidize and break up the glucosides. The author discusses the various forms in which digitalis is prescribed.

A few of the suggestions made are the following: Digitalis powders should be prepared freshly to avoid deterioration of the glucosides through absorption of moisture. The points of importance in making an infusion of digitalis are the avoidance of prolonged heating and filtration through paper, the use of concentrated infusions is quite inadmissible. The excipient for digitalis pills must not contain water, the most suitable substance being wool fat. Since it is noted that resorption of digitalis takes place in the rectum and that the dissolved substances are carried straight into the *vena cava superior*, thus avoiding the liver, where far-reaching processes of decomposition always take place, the rectal method of administered digitalis, in the form of suppositories is highly desirable, and preferable to the intravenous route. It is essential, however, that digitalis preparations for rectal application be water-soluble and contain all water-soluble glucosides unchanged. Such a water-soluble product is obtained by percolation of the leaves, the percolate is evaporated in vacuo, and the dry residue is made up with dextrin or pure glucoside to the original weight of the digitalis leaves used; after biological testing and standardization the suppository is made, with care taken not to heat the theobroma oil above 40° C. Aqueous digitalis preparations are the only ones suitable for injection, but since decomposition of the glucosides takes place almost immediately, it is necessary to use a 2-chambered ampul, one containing the sterile water, the other the residue of the alcoholic digitalis glucoside solution (alcohol removed); the contents are mixed just before use.—R. Rapp, *Wissensch. Pharm. Rezeptur u. Defektur;* through *Pharm. J.*, 123 (1929), 369; 442.—J. P.—*Squibb Abstract Bulletin.*

OMISSIONS FROM THIS NUMBER.

On account of the addresses of the presiding officers and Association Business it is necessary to omit several of the Departments from this number of the Journal.